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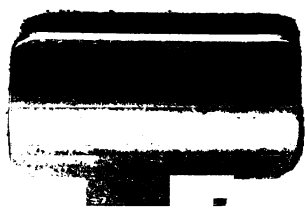
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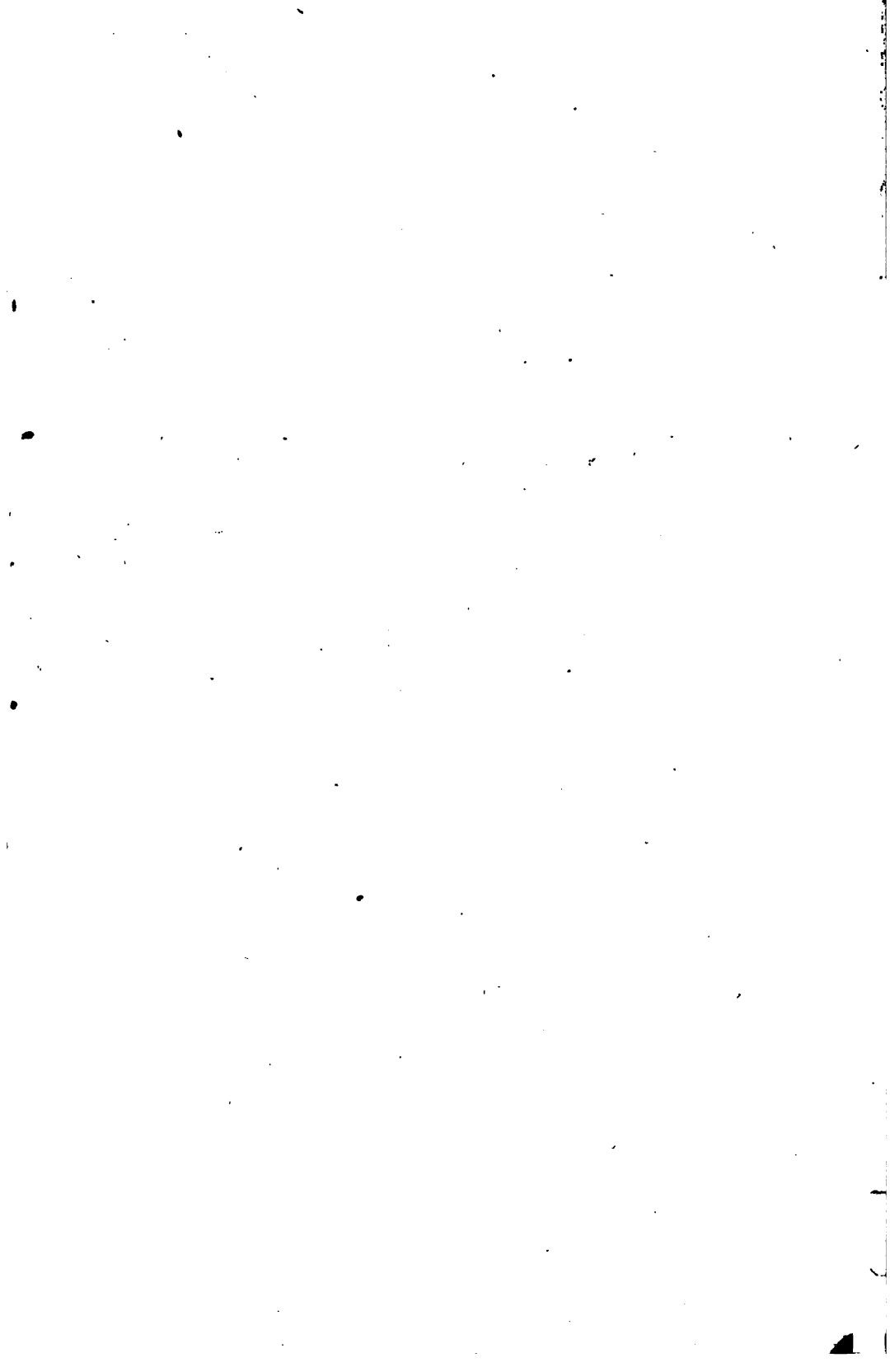
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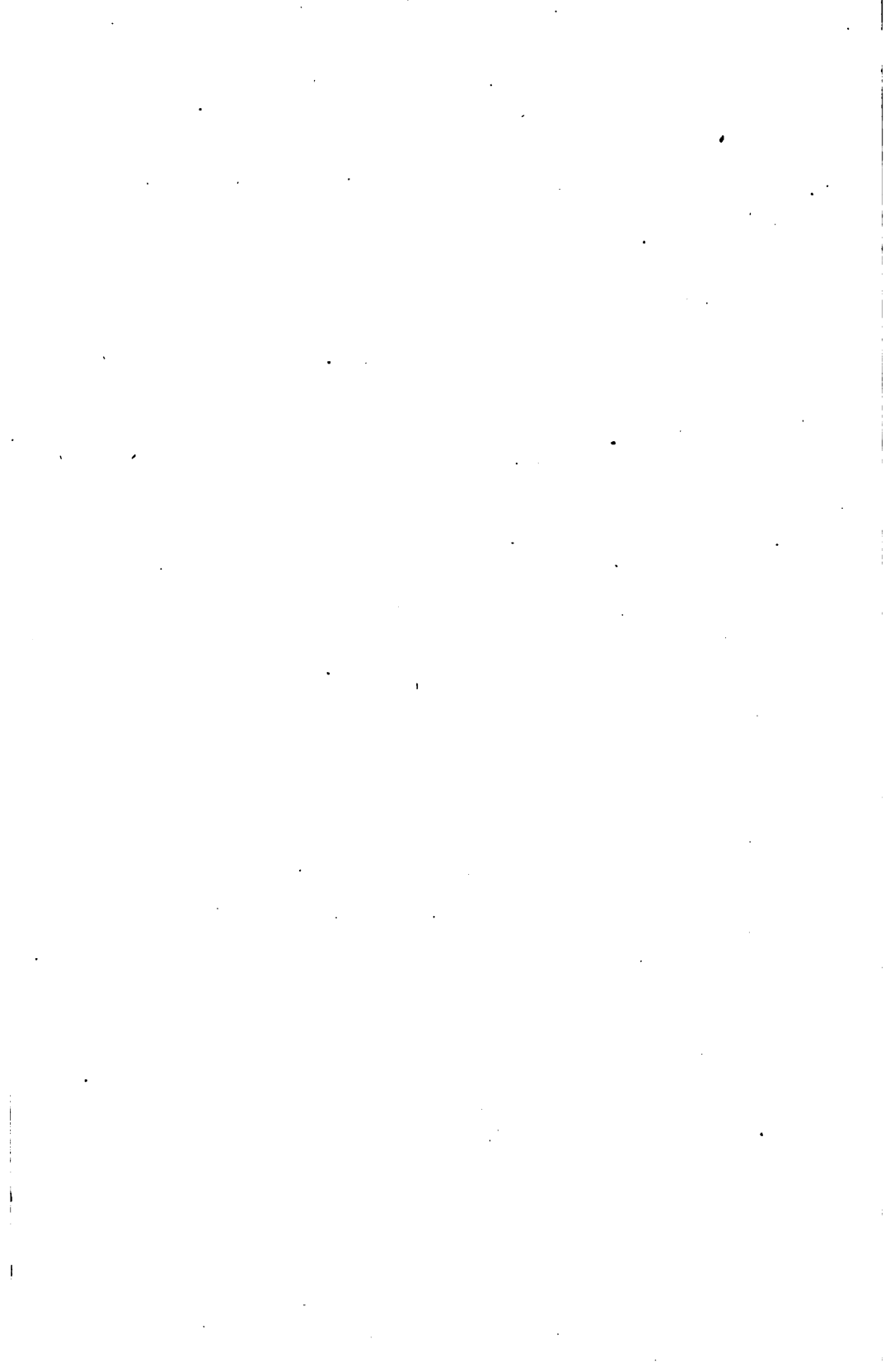
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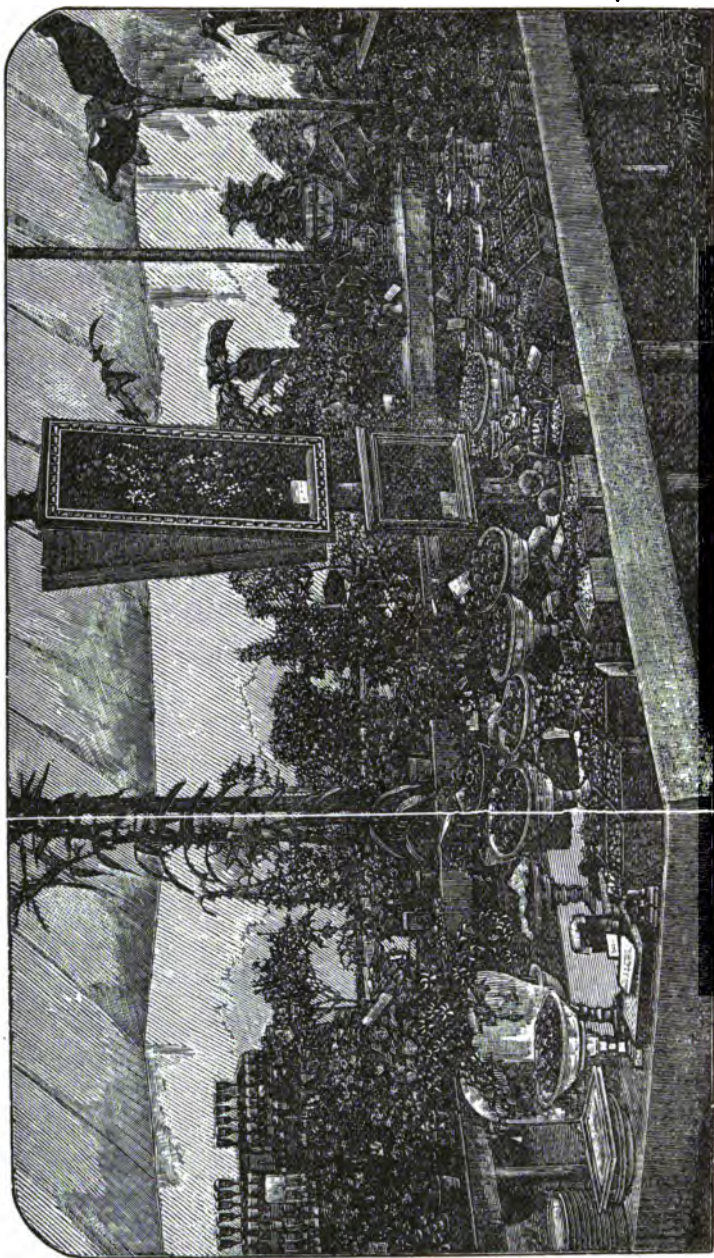


PLATE OF FRUITS, AS EXHIBITED AT THE COLORADO STATE HORTICULTURAL FAIR.

Fruit Culture in Colorado.

A Manual of Information.

By WILLIAM E. PABOR,

AUTHOR OF "COLORADO AS AN AGRICULTURAL STATE."

"GOD ALMIGHTY FIRST PLANTED A GARDEN, AND INDEED IT IS THE PUREST OF ALL HUMAN PLEASURES. IT IS THE GREATEST REFRESHMENT OF THE SPIRITS OF MAN, WITHOUT WHICH BUILDINGS AND PALACES ARE BUT GROSS HANDWORKS, AND MAN SHALL EVER SEE THAT WHEN AGES GROW TO CIVILITY AND ELEGANCE, MEN COME TO BUILD STATELY SOONER THAN TO GARDEN FINELY, AS IF GARDENING WERE THE GREATEST PERFECTION.—LORD BACON.



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1883.

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April 1883

PREFATORY NOTE.

"What is it? Only a handful of earth, to your touch
A dry, rough powder, you trample beneath your feet;
Dark and lifeless; but think for a moment, how much
It hides and holds that is beautiful, bitter or sweet."

OUT of the earth cometh vine and plant, bush and tree, to bless mankind, "and there's no more beautiful riddle the whole world round" for man to study than the mystery of fruit culture.

This, in Colorado, is in its infancy. We have but touched the border-land of possibilities. We see, through the mists of the present, the fruit-lands of the future; but whether they lie on the fair slopes and in the beautiful vallies of our eastern border, or in the new and untried vallies beyond the range on the Pacific slope, in Gunnison, Uncompahgre, and Grand vallies along our western border, who shall be daring enough to say positively? For fifteen years fruit culture has been an experiment with many, whose opinions are grouped together in this Manual. And yet, who can declare that he has mastered the difficulties that surround the subject or can advise with perfect safety?

The Jeweler takes gems from many mines, and with keen lapidarian skill, after a season of labor presents to the eye a necklace or a tiara flashing in brilliancy and perfect in color. But the gems he did not create. He was but a master workman, worthy of credit only in so far as his skill has been shown.

So the compiler of this little pamphlet claims for it no merit as to any originality of his own. He has but brought into compact shape and easy form the varied experience

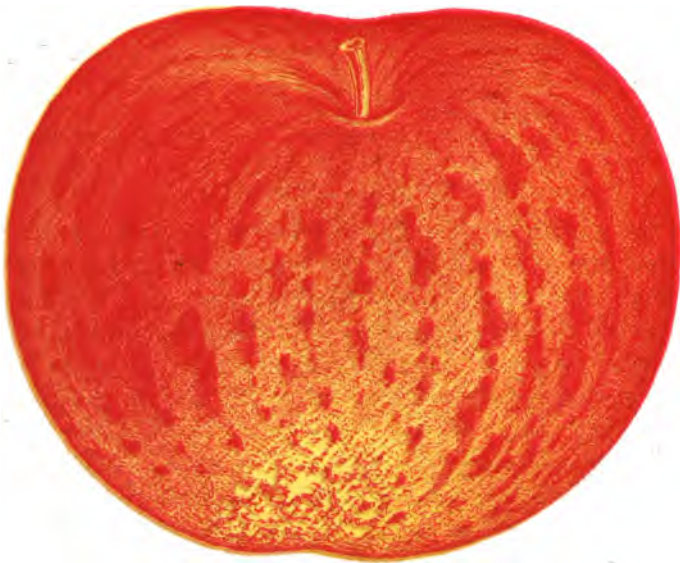
of those who have learned a little in the field of horticulture and have been willing to tell it by word of mouth or motion of pen to others, seeking some rays of light in the shadowed land of doubt and uncertainty.

In the hope that it may prove of service to all who are engaged in, or propose to enter upon the pleasant occupation of Fruit Culture, the compiler permits this little pamphlet to go forth as evidence of his own love for, and firm faith in, the future of Fruit Culture in Colorado.

W. E. P.

Shady-side, Argyle Park, near Denver, Colo., Jan., 1883.





DUCHESS OF OLDENBURGH.

Grown and For Sale by

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GENEVA, N. Y.

APPLES.

"Come, let us plant the apple tree,
Cleave the tough greensward with the spade;
Wide let its hollow bed be made;
There gently lay the roots, and there
Sift the dark mold with kindly care
And press it o'er them tenderly;
As 'round the sleeping infant's feet
We softly fold the cradle sheet,
So plant we the apple tree."

—Henry W. Longfellow.

INTRODUCTORY REMARKS.

AS the garden was the first habitation in which we are told Man was placed, so the apple is the first fruit of which mention is made as flourishing in it. And, while it is supposed to have been the cause of his banishment from the home first given him, it is to be stated to the credit of this fruit, that it followed him out of the Garden of Eden and has kept him company and been a solace to him all through his wanderings over the earth, in almost every zone and under the most adverse circumstances, thereby endeavoring to atone, as far as lay in its power, for the trouble it originally caused.

Many centuries passed before "varieties" were catalogued. Even up to the time of Pliny, the Roman historian, but a score or so were named by the pomologists of that era. In these later days we are given, by such undoubted authority as Professor Warder, a list of over two thousand from which to select; varieties adapted to every month in the year, of every conceivable flavor, size, shape, color.

The value of the apple, considered apart from its market value, is well set forth by a correspondent of *Coleman's Rural World*, while discussing the apple for its health-

giving properties. "As an article of food they rank with the potato, and on account of the variety of ways in which they may be served, they are far preferable, to the taste of many persons; and if families would only substitute ripe, luscious apples, for pies, cakes, candies and preserved fruits, there would be much less sickness among the children, and the saving in this one item alone would purchase many barrels of apples. They have an excellent effect upon the whole physical system, feeding the brain as well as adding to the flesh and keeping the blood pure; also preventing constipation and correcting a tendency to acidity, which produces rheumatism and neuralgia. They will cool off the fevered condition of the system; in fact, they are far better for these purposes than the many nostrums which are so highly praised in the advertisements and so constantly purchased by sufferers. A ripe, raw apple is entirely digested in an hour and a half, while the boiled potato takes twice that time."

THE APPLE IN COLORADO.

What was said by Joseph Wolff, of Boulder County, in 1872, as regards success and failure in fruit culture in Colorado, is as true to-day as it was then; though we have this advantage over those earlier days, that we have an experience covering ten years or more by which to guide our steps as we cautiously feel our way forward. He wrote: "Fruit culture in Colorado is now a system of experimenting, and must for years be largely in that condition, until experience shall determine what varieties to plant, the kind of soil required, the proper tillage, irrigation, mulching, fertilizers, etc. My own opinion is that Colorado will yet rival any of the Middle States in the production of fruits, and, for one, I propose to keep on trying till I succeed." In this laudable work he has continued—to his credit be it said—unto this day. How much more worthy would he be of honor from the hearts of those who are struggling in

these fruit experimental fields, were he but as ready to write of his experience now as as he was ten years ago,

Said Major Henry McAlister, of Colorado Springs, in an address on Apple Culture in Colorado before the El Paso Horticultural Society, in January, 1882: "There is no longer any doubt that apples can be grown successfully in all that portion of Colorado east of the mountains. The experience of a number of persons both in the northern and southern sections of the State justifies the belief that, within ten years, the Colorado demand for apples will be fully met with Colorado-grown fruit. It is true that much experimentation must still be practised before the full capabilities of our soil and climate are learned, but enough is known to make the planting of an apple orchard a matter attended no longer with any considerable risk, provided that in doing so the advice be taken of those whose experience during the past ten or fifteen years have resulted in complete success. Although I have no doubt that the list of apples that can be grown to advantage in Colorado will be very much enlarged by future experiments, I believe that there are many kinds now grown very successfully east of the Mississippi that will not do well in the peculiar climate of the Rocky Mountain region."

LOCATION AND SOIL.

We group together the advice, given on this important subject, by those who have thus far come under our observation in the public prints or in private correspondence.

J. W. COOK: The best location for an orchard is on upland, with a gentle slope to the east or south. Apple trees, however, will not grow on land subject to seepage. The trees should be set close together and should be made to branch out near the ground so as to protect the trunk from the burning rays of the sun.

J. H. NEWCOMB: Any ground that will grow soap-weed, sage-brush, or buffalo-grass will grow trees if under water and proper tillage.

J. N. CARNOHAN: Clay upland soil, well matured, is the best. Clay will hold the trees solid.

A. N. HOAG: I favor a soil that is a clay loam with porous clay sub-soil undulated with shale. My orchard is on land sloping south on quite a hill-side.

JESSE FRAZIER: My orchard is on what is termed second bottom land, mostly; part of it is on first bottom; these last are not in so thriving a condition, and apparently are not doing so well as those that are on the upland soil.

HENRY MCALISTER, JR.: In planting my trees I take great pains in preparing the ground. The soil of my garden is fully three feet deep. A hole is dug six feet in diameter and five feet deep. The top soil is thrown to one side and two feet of gravel carted out to repair the street or sidewalk. In place of the latter I put good soil mixed with rotten manure. When the excavation is nearly filled up I have put in the trees, and, after arranging the roots in their natural condition, throw in the top soil first removed, settling the earth around the roots by throwing upon it a few buckets of water. Trees so planted will do well, even on light ground, without more than one or two irrigations a year, although twice as many will not injure them.

J. S. PERKEY: Prepare your ground for planting fruit trees in the fall of the year. Choose a north slope, if possible, plowing trenches eighteen inches deep with the slope of the ground. By plowing the trenches the sub-soil is exposed, freezing and thawing in the winter; and by planting time in the spring it has become pulverized and is in a fit condition to be placed about the roots of the trees. Leave about six inches of pulverized earth in the bottom of the trench where the tree is to be planted; set the tree in and place each root in its natural position. Fill in about three inches of fine earth and throw half a pail of water upon it, that the earth may settle close about the roots. Fill the trench about two-thirds full of dirt, tread it lightly, that the

tree may stand firm, then plow the trenches full, level with a harrow, taking care not to bark the trees.

G. W. WEBSTER : Colorado soil is rich enough for apple culture, just as it is, if enough water is used. There is no necessity for manuring; but if you must do it, leave the manure on the top of the ground for one year, and then spade or plow under.

D. S. GRIMES: In this, as in other States, nature, when well studied, will furnish reliable evidence as to best location in her own tree planting. We find her best specimens growing on a northern exposure, grading east and west. A northern exposure furnishes a more even temperature, is not precipitated into an unreasonable or dangerous growth in early spring. The soil retains coolness and moisture—two essential conditions to tree growing. The eastern exposure catches the warm morning sun, starting early the growth, which, as the sun recedes in the west, is gradually prepared for the cool atmosphere of nightfall. In the western exposure we find conditions in many respects resembling those of the north. A southern exposure, on account of bad winds and the effects of the sun, is the most unfavorable for trees but good for vines. Lowland located near streams of water, or where a wet, cold subsoil exists, is very unfavorable to the growth of fruit trees. In regard to soil, it is generally good enough in Colorado in its natural state, but the alluvial soil found near the mountains is undoubtedly the best. The soil requires no manure until the trees come into bearing. Trees in full fruiting draw heavily on the soil, and a corresponding feeding, or fertilizing, is required to insure perfect crops.

PLANTING AND CULTIVATION.

Says Mr. J. H. Newcomb, giving hints on transplanting: "In setting out fruit of any kind a person should select high and naturally well-drained ground, that can be irrigated and has been worked one or two seasons. Plow or

make cross furrows first, the distance at which you want to set, then plow the distance the other way, and where you wish to have your water run, dig holes larger and deeper than is required. As freshly stirred ground is a big advantage, take your trees as fast as you are ready for them from the heel. Cutting the tops back is beneficial, but in all cases pay attention to the roots; be sure and cut off all the bruised roots; look at them carefully, and if the ends have begun to kill back, cut till you come to good, sound, healthy wood, then fill up your hole with top dirt till your tree will set as deep, or perhaps an inch deeper, than it did in the nursery. Set your tree in, throw in your dirt, and if the ground is damp enough tread it well, being careful to have it solid next the crown so no air can get in; throw a little loose dirt over the tramping, and you are done. Do not hill up to them."

The following instructions are given by D. S. Grimes: In planting trees the holes should be of sufficient size to admit the roots in a natural position, without bending or cramping. Pare off with a sharp knife all broken or bruised roots, sloping from the underside. Do not suffer the roots to become dry; the small fibres are the feeders, the large roots holding the tree in place. *Fresh manure placed in direct contact with the roots is injurious and dangerous.* Cut back the tops in proportion to the loss of roots in digging, say one-third. Place the heaviest part of the top of the tree to the south-west, or about where the two o'clock sun will strike the trunk. A stave or stake driven on that side will prove a good protection against the scorching rays of the sun, which kills more trees than the cold.

As regards the proper time to plant, there is a difference of opinion. Some favor spring, others regard the fall as the best time. J. W. Cook favors the latter method. Mr. J. H. Newcomb says that unless in very protected localities he advises planting in spring as early as trees can be procured, in case there is sufficient moisture; otherwise as soon

as water is in the ditches. J. W. Cook holds to the theory of fall planting. His method is as follows: Plow very deep and set on grade. Draw a chain on the ground to make a mark for the trees and set them about an inch deeper than they were in the nursery. Pack the ground, and afterward there may be planted between them some hoed crop, but no grain. Branch within six or twelve inches of the ground; head low and use no manure. It is well to mulch some around the trees to keep the sun from burning them. Cold does not hurt trees. It is the dry air and hot sun.

The distance apart to set trees has not yet been authentically established. J. W. Cook says set trees twelve feet apart each way; they do better thick and bear better than if set too far apart. Mr. Jesse's Frazier's orchard has them set sixteen feet apart, the trees not set opposite each other, but in this style:

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Mr. J. H. Newcomb says standard apple trees should be fifteen feet apart each way. Mr. D. L. Tracy gives three lists of varieties that should be set 40, 30 and 20 feet apart, as follows:

FORTY FEET.—Yellow Belle Flower, Ben Davis, Wine-Sap, Northern Spy, Talman's and Golden Sweet.

THIRTY FEET.—Rambo, Russett, Jonathan, Early Harvest.

TWENTY FEET.—Red June, Early Joe, Summer Pearmain, Red Astrachan, Tetofski.

Jesse Frazier cultivates as follows: In the spring he plows the soil between the trees to a depth of four inches and cultivates through the season enough to keep down the weeds. A furrow is run between every row and water applied up to as late in the season as water can be obtained. In the spring he is governed by the kind of winter that has passed. If a wet one, no irrigation is likely to be required until late in the spring. He aims, when irrigating, to soak

all the ground thoroughly, and considers this method essential to success. All his trees are low headers, obtaining thereby as little trunk as possible; the branches effectually shading the trunk from the sun. There is not a wind-break about the orchard. Many trees in his orchard are nearly a foot in diameter, and all through the orchard can be seen limbs broken off by the weight of fruit they bore.

Mr. Anson Rudd, who commenced experimental fruit culture as early as 1864, for a long time met with no success; but this did not discourage him, and he has now a nice little orchard of about two hundred trees. His land is level, and he keeps it in clover, believing that it is a great protection. His trees grow low, many of the branches, when the fruit is on them, laying on the ground. He applies salt in abundance and believes that too much cannot be scattered on the soil about the trunks of the trees.

Mr. J. S. Perkey says that for the first three years an apple orchard could be profitably planted to corn, besides being of benefit to the trees, shading them from the sun and protecting them from the wind. This prevents blasting. He also recommends leaving stalks standing, as a good winter protection, causing the snow to lodge where the wind will not sweep it away.

As regards size and age of trees, Mr. J. H. Newcomb gives the following advice: Trees that have obtained the height of five to seven feet, comparatively stocky, if but two years old so much the better, of well-matured, ripe wood, are, in my opinion, the best to plant; younger trees are apt to be not sufficiently hardened up to transfer, and older are liable to have further back-set. They can easily be taken up at that size and age with a tree-plow, retaining nearly all of their roots, and, if they have not been hurt in handling, start at once.

IRRIGATION.

We group the following opinions on this important subject :

A. N. HOAG : Apple trees require only a moderate share of water.

J. N. CARNOHAN : Irrigate slowly. Too much water, run fast, washes the roots bare. Remember, the ground when cultivated is consequently loose and washes easy.

W. F. WATROUS : My practice has been to use all the water necessary to keep trees in a vigorous, growing condition from the time they start in spring up to about the middle of August. Then use no more water until late in the fall.

D. S. GRIMES : We have verified the wisdom of this practice (Mr. Watrous's) by withholding water and cultivation in August from some rows and thoroughly watering and cultivating other rows. The first rows made a fine, heavy growth, ripening up their wood perfectly. The last made a heavy growth, did not cease growing until September, and consequently did not ripen up their wood nor pass safely through the following winter. I use but a small stream of water while irrigating. You can thus soak the ground thoroughly without washing the furrows ; but be sure and remember that fruit trees will not grow in a swamp. Too much water is bad medicine.

J. C. WOODBURY : Many who attempt to grow apples spoil their trees by irrigating too much. Water should be used sparingly, from early spring until late fall, when plenty could be applied to prepare the tree to go into winter quarters.

G. W. WEBSTER : Apply water liberally the first year, say every week ; afterward every two or three weeks until the trees are well established, when once or twice during the season is sufficient.

JOE WOLFF : Orchards should be thoroughly irrigated late in the fall. No matter how wet the winter may be, it

cannot injure the tree. No matter how dry it be, thorough irrigation late in the fall will save the trees and keep them ready for a vigorous start in the spring.

G. W. WEBSTER: The cause of winter killing is drouth. The more water given in the fall the better. I once had my whole orchard under ice one entire winter and did not lose a single tree.

J. S. PERKEY: Before freezing weather sets in the orchard should be thoroughly irrigated, that the ground may retain its moisture through the winter.

PERRY WHITE: Give trees lots of water in the fall for winter safety. My plan is as follows: When the leaves begin to fall, soak the orchard in water, giving the ground as much as it will hold. Then the tree is always plump and does not shrivel up.

In Utah, according to a correspondent of the *Utah Farmer*, where orchards are watered early in the season and the ground saturated while the leaves are young and tender, the trees are liable to be injured, for the reason that the feeders are in active operation, and too much moisture forced into the young and tender leaf bursts its vessels and renders it of little use. If this excessive watering is kept up the whole of the growing season, the tree becomes sickly and will show a discolored leaf the following spring.

WIND BREAKS.

Opinions differ as to the advisability of wind-breaks. The largest orchard in the State, that of Mr. Jesse Frazier, at Florence, Fremont County, has no wind-break whatever, and he declared to the writer of this that the outside rows of trees in his orchard, most exposed to storms, always yielded the best.

J. W. Cook, of Arvada, who, however, is better authority on grapes than on apples, says: In setting out an orchard the wind-break should be set on the west and north sides to protect the trees from the sharp, drying winds of winter

and spring. Undoubtedly the best tree for this purpose, as well as for fencing, is the honey locust. In four or five years the honey locust will make not only a most effectual wind-break, but a fence that neither man nor beast will go through. It is a rapid grower, and the wood makes excellent fence posts and firewood.

Mr. Anson Rudd, who resides at Canon City, in the Arkansas Valley, says that the storms that strike his section of country generally come from the south-east and are often very severe and cold; but he has observed that the sides of the trees that face these storms are always the heaviest growers; thus confirming the experience of Mr. Frazier, who lives in the same valley, ten miles further from the foothills than Mr. Rudd.

G. W. Webster, of Longmont, Boulder County, says his experience has taught him to do as they do in Utah and California, to use no other wind-break than the apple trees themselves, planting the outward row of an orchard twice as close as those on the inside. No high wind-breaks, he says, are needed in Colorado.

PRUNING.

A. N. HOAG: In pruning I sometimes rub off the collar sprouts in summer; while my main pruning is done in December.

J. S. PERKEY: Never forget to give your trees a thorough top trimming each year. Thus a low-headed, sound-bodied, and well-rooted tree is obtained.

J. H. NEWCOMB: I prefer pruning in young trees as they are growing, pinching back the ends of limbs with thumb and finger, and brushing off with the hand buds as they appear where they are not wanted to grow.

D. S. GRIMES: Prune a tree in the way it should grow—from the top of the future tree, while young. Little branches, like little faults, leave no scars if corrected in infancy, but the cutting away of large limbs to correct early

mistakes, leads to disease, decay and death. In this country of scorching suns and drying winds prune sparingly but judiciously.

LATE FROSTS.

Henry McAlister, Jr., says on this subject: "It may not be generally known that there are varieties of apples whose blossoms are not in the least injured by frost, or even by hard freezing. In Colorado, where we so frequently have late frosts, it is essential that we should select such kinds of apples as are not injured thereby. Having learned that June frosts are of common occurrence in the northern part of New England, I recently wrote to a gentleman living near Montpelier, Vermont, who is much interested in fruit growing, for his experience upon this subject. In his answer he says, 'I have long since discarded all varieties of apples that are injured by late frosts. I find that if the blossoms of the Fameuse, Wealthy, Tetofski, Yellow Transparent, and a few other varieties, be frozen stiff on the trees, it does not in the least degree lessen their crop of apples or injure the fruit in any way.' A friend sends me a late number of the *Vermont Watchman* and *State Journal* which contains a letter from a lady living in Milan, New Hampshire, complaining of the difficulty of raising apples on account of June frosts, which are frequent and severe in that locality, and kills the bloom and causes the apples to fall off. She wishes to know if there are any kinds that are not injured by such freezing. The editor, an experienced horticulturist, answers as follows: 'There are; and last June gave us as severe a test as is ever likely to occur. But of more than one hundred varieties that blossomed last spring the following sorts seemed entirely unaffected, and produced nine-tenths of all the apples we had—of summer fruit, Tetofski and Yellow Transparent; of fall apples, Peach Apple, Duchess of Oldenburg and Pringle Sweet; of winter apples, Fameuse, Wealthy, and Scott's Winter.'"

DAMAGE DONE IN SUMMER.

Mr. J. W. COOK: The hot sun of summer frequently burns the trees black. It leaves them with but little vitality. The greatest damage is done in August. A little vitality is left, just enough to support the tree for a short time, and then the cold of winter is unjustly charged with doing the damage. It is the hot sun that causes the fire blight on the top of the tree. The body is not affected, at first, but it gradually dies down to the root. South and east slopes are preferable for wind-breaks. Such positions break the harsh, dry winds of the north and west.

WINTER PROTECTION.

Mr. J. S. FLORY, of Longmont, furnishes the following as his experience in the care of fruit trees during the winter: "To make fruit-raising a success in Northern Colorado we must know how to save our trees through the winter; if we succeed in this, all is well. Yes, says one, there is where all the trouble comes in; the young trees die through the winter or in early spring. So they will if the body is not protected from the hot rays of the sun. What kills three-fourths of the trees that die is the hot rays of the sun beating upon the south-west side of the trunk of the tree, heating the trunk and sap, and then at night a severe freeze comes, and the tree is ruined. I have seen trees of good size that were thus killed on the south side as if scorched by fire, the bark peeling off and the tree finally dying. Sometimes a hot wind will also cause trees to die. Now for the remedy, which is simply to protect the trunk or body of the tree every winter until the branches are sufficient to shade the body. This is readily done by taking tar paper, such as is used in building, cut it in strips long enough to reach from the ground to the branches of the tree, and with heavy twine or wire, such as is used in binding grain, loosely tie strips of paper around the tree, having first bent them so as to form a kind of hollow tube. This also saves the tree

from the depredations of rabbits and the effect of sleet. When the tree leaves out these strips can be laid aside for the following fall. Any one who says that this is too much trouble ought to go without fruit all the days of their life. To set young trees leaning to the south-west is also advisable, that the top will the sooner shade the trunk."

HENRY MCALISTER, JR., in response to enquiries as to whether or not he protected his trees in the winter, replied: Only by shading the trunks from the rays of the sun. This can be done either by placing a broad board against the south side, or by loosely wrapping the trunk with a strip of old gunny sack. Building paper coiled very loosely around the trunk of a tree answers well; anything to keep off the sun when the sap is down.

D. M. ROSE: I do not protect my trees further than by throwing coarse manure around them, as a mulching, early in the winter; this keeps them back in the spring, and also keeps down grass and other injurious growths.

J. S. PERKEY: I advise mulching trees to a depth of from twelve to eighteen inches after the first hard frost. By so doing the frost is retained about the roots, thereby preventing a premature rising of the sap and also protecting the buds from late frosts. I consider mulching very essential, even in the spring when young trees are planted. Coarse litter should be used, such as rotten straw, etc., but in no instance use fresh stable manure. Mulch three or four inches deep from three to four feet away from the body of the tree. In addition to protecting the roots near the surface from the intense heat and dry winds which sometimes prevail during the summer months, the mulching serves as a fertilizer.

G. W. WEBSTER: Do not protect by wrapping, etc., in winter. It only makes a tree tender.

D. M. ROSE: Protect your trees by mulching after the ground freezes. It keeps back blossoming in the spring until all danger from frost is over.

1880-1881. A WINTER TEST.

The winter of 1880-81 was exceptionally severe in Colorado, as elsewhere; and some varieties of fruit, up to that time deemed hardy and able to withstand the severe test of our winter seasons, proved themselves unworthy and unreliable. In Southern Colorado the following were reported by E. R. Sizer as having been killed:

Keswick Codlin, Early Harvest, Early Pennock, Fall Winesap and Jonathan.

Those that came out, with him, in good condition, were the following:

Duchess of Oldenburg, Red Astrachan, St. Lawrence, Grimes's Golden, English Russet, Red Canada, Peck's Pleasant, Ben Davis, Baily Sweet, Northern Spy and Perry Russet.

Mr. Sizer lives in the valley of the Purgatoire, in Bent County, in the extreme southern part of the State.

Mr. Jesse Frazier reported those showing the greatest injury as—

Maiden's Blush, Early Harvest, Rawle's Janet, Sweet Romanite, Keswick Codlin, and Tompkin's County King.

In Northern Colorado, out of seventy-two varieties grown by D. S. Grimes, the following only came out in good condition:

Red Astrachan, Saps of Wine, Tetofski, Duchess of Oldenburg, Summer Queen, Alexander, Wealthy, Fameuse or Snow Apple, Haas, Porter, Ben Davis, E. G. Russet, Perry Russet, Tanver, Missouri Pippin, Northern Spy, Pewaukee, Stark, Little Red Romanite, Walbridge.

DWARFS.

Mr. E. B. Cosson, of Colorado Springs, is strongly of the belief that dwarf and dwarf standard apples are eminently preferable to standards, and particularly for garden culture.

Among the advantages of the dwarf trees, he says, may be cited the following:

First—(and this, in Barry's estimation, is the greatest) the freedom of short trunks from insect troubles.

Second—(and in Colorado probably the most worthy of consideration) they are less exposed to the wind.

Third—They are more accessible for management and gathering of fruit.

Fourth—They suffer less from extremes of hot and cold and sudden changes of weather.

Fifth—They bear much earlier.

Sixth—They produce larger and finer fruit.

Seventh—They occupy less space, allowing a greater variety of fruit to be grown on a limited area.

Eighth—They are more in harmony with the surroundings, and are in keeping with the rest of the garden.

On the other hand, JESSE FRAZIER, whose long experience is a warrant that his opinions are worthy of consideration, does not think dwarfs of much account. They require so much attention, he says, as standards, and do not bear so well.

MR. D. S. GRIMES: Dwarf apples are admissible in crowded city lots where ornament rather than profit is the object mainly sought. They come into bearing early, but are short-lived.

VARIETIES RECOMMENDED FOR NORTHERN COLORADO.

By D. S. GRIMES.—*Summer Apples*: Red Astrachan, Duchess of Oldenburg, Saps of Wine.

Fall Apples: Fameuse, Alexander, Haas, Queen.

Winter Apples: Ben Davis, Wealthy, Walbridge, Missouri Pippin, Pewaukee, Little Red Romanite, Perry Russet.

By J. H. NEWCOMB.—*Summer*: Early Harvest, Duchess of Oldenburg, Red Astrachan, Tetofski.

Fall: Fall Pippin, Fall Wine, Rambo, Maiden's Blush

Winter: Ben Davis, White Winter Pearmain, Wine Sap, Northern Spy.

By M. N. EVERETT.—*Summer*: Red Astrachan, Duchess of Oldenburg, Early Harvest, Queen.

Fall: Fameuse, Autumn Strawberry, Tetofski.

Winter: Ben Davis, Jonathan, White Winter Pearmain.

By WILLIAM LEE.—*Summer*: Golden Sweet, Duchess of Oldenburg, Tetofski, Red Astrachan.

Fall: Summer Queen, Pryor's Sweet, Maiden's Blush, Fameuse.

Winter: Blue Pearmain, White Winter Pearmain, Ben Davis, Jonathan.

By FARMERS' INSTITUTE, FORT COLLINS.—*Summer*: Duchess of Oldenburg, Red Astrachan.

Winter: Ben Davis, White Winter Pearmain, Wagnes, Jonathan.

VARIETIES RECOMMENDED FOR SOUTHERN COLORADO.

By JESSE FRAZIER.—*Summer*: Jeffries, Duchess of Oldenburg, Early Harvest, Red Astrachan.

Fall: Cole's Quince, Sweet Pear, Jonathan, Fameuse or Snow Apple.

Winter: Ben Davis, Wine Sap, Willow Twig, Rambo, Genitan.

By ANSON RUDD.—*Summer*: Red Astrachan.

Fall: Sweet Pear, Fall Pippen.

Winter: Willow Twig, Genitan, Ben Davis.

By H. MCALISTER, Jr.—*Summer*: Duchess of Oldenburg, Early Harvest, Red Astrachan, Tetofski.

Fall: Fameuse.

Winter: Ben Davis, Yellow Transparent, Wealthy, Walbridge, Pewaukee.

By D. M. ROSE.—Ben Davis, Duchess of Oldenburg, Horse, Fameuse, Early Harvest, Red Astrachan, Little Red Romanite. But any variety grown in Iowa or Illinois can be grown in Colorado.

By W. A. HELM.—Genitan, Winesap, Red Astrachan, Ben Davis.

By CRAWFORD & CHASE.—Yellow Transparent, Wealthy, Walbridge, McIntosh Red, Duchess of Oldenburg, Pewaukee, Red Astrachan.

A SUGGESTIVE LIST OF VARIETIES FOR A TWO-ACRE ORCHARD IN SOUTHERN COLORADO.

By H. McALISTER, Jr.:

20 Duchess of Oldenburg.	5 Pewaukee.
15 Tetofski.	10 Wealthy.
10 Yellow Transparent.	10 Fameuse.
5 Pringle Sweet.	5 Ben Davis.
10 Red Astrachan.	5 Little Red Romanite.
	5 McIntosh Red.

VARIETIES LIKELY TO BE SUCCESSFUL.

Scott's Winter and Magog Redstreak come highly recommended from Northern Iowa; also by W. C. Barry, of New York, and by Dr. Hoskins, of Vermont, as possessing the combined qualities of hardiness and productiveness.

Early June. Trees in Mr. E. B. Stark's garden at Colorado Springs bore at an age of five years. This tree blossoms late in the season. Mr. D. S. Grimes, however, does not recommend it for Northern Colorado.

WINTER APPLES.

We are not able to agree with Major Henry McAlister, who has expressed an opinion that the people of Southern Colorado (or of Northern either) should confine themselves to growing the summer and fall varieties, for the reason that the winter apple can be so cheaply brought in from the East. This is the very thing the people of the State ought to prevent, and so keep thousands of dollars from going out of the State yearly to enrich Missouri, Michigan, Iowa, Kansas and Nebraska apple-growers. If there was any

reasonable doubt that winter apples could not be grown, and to a profit, the case would be altered. As it is, it is the worst kind of advice to give to fruit culturists, or to be placed upon the records of a County Horticultural Society, and we hope to see it recalled at an early day.

THE APHIS.

While, as yet, apple trees in Colorado have not been troubled with insects to any great extent, there is no knowing how soon they may be attacked by the *Aphis* tribe. Hence it will not be out of place to present the insect to our readers, and give the remedies recommended, as we find them in a treatise on insects injurious to fruit trees, issued by authority of the California State Board of Horticultural Commissioners.

The *Woolly Aphis*, or Apple Tree Aphis, named *Aphis Mali* by Packard, and by Figuiier *Myzoxle Mali*, is thus described: This insect is of a dark, russet brown color, with the upper part of the abdomen covered with very long white down. This species of aphis, according to M. Blot, can only exist on the apple tree. Carried away and placed on another tree it soon perishes. It does not attack the blossom, the fruit, nor the leaves, but fixes itself on the lower part of the trunk, whence it propagates itself downwards as far as the roots, underneath the graftings, etc. It also likes to lodge in the cracks of the trunk and large branches; but it generally looks out for a southern and avoids a northern aspect. It is not active, walks very little, and its dissemination from place to place can only be explained by the facility with which so small an insect can be transported by the wind, its lightness being still increased by the down which covers it."

"The *Myzoxyli Mali* renders the wood knotty, dry, hard, brittle, and brings on rapidly all the symptoms which characterize old age and decay in trees attacked."

REMEDIES RECOMMENDED.

M. Blot, for preserving the apple trees from this pest, says: Employ for the seed-beds the pips of bitter apples only; give to the nursery and to the plants only as much shelter as absolutely necessary; avoid those sites which are low and damp; encourage the circulation of air and the dessication of the soil; surround the foot of each apple tree with a mixture of soot, tobacco and fine sand."

The *Aphis* has been quite destructive in portions of Indiana, Kansas, Kentucky, North Carolina and in the South. In Kansas it is reported as on the increase, and we may look for it any season in Colorado. Says an exchange: In the West, saponaceous washes upon trunks and limbs (exposed for the purpose) have been found beneficial. For trees growing in loose soils one correspondent recommends mounding up and packing earth around trunks, after applying the soap-suds. In North Carolina Peruvian Guano is regarded as a preventive, both by driving the insect away and invigorating the tree. Washes of soap and Peruvian and other guanos are used for the branch-infesting form of this species quite successfully.

DISEASED OR SCABBY TREES.

Remedy: J. S. Perkey. If trees become scabby or diseased, wash them with a weak solution of lye. It kills insects and restores the tree to health.

THE APPLE TREE BORER.

The flat-headed borer is the, at present, dangerous enemy to Colorado orchards. It is, when a perfect insect, a white striped beetle about three-quarters of an inch long, flying at night. It lays its eggs in June, and the worm, hatched from these eggs, eats into the wood, where, according to D. S. Grimes, it feeds on the soft outer layers, excavating a shallow, round cell under the bark, running upwards or around the tree. These cells are always filled with

worm dust crowded and compacted together, some of which becomes crowded out through a crack in the bark or a hole made by the worm. It is by seeing this sawdust-like powder protruding out of the bark that we detect the presence of these borers in the tree." It feeds here for about a year, and has then grown strong enough to attack the solid wood, into which it bores a cylindrical hole three or four inches, inclining upwards towards the centre of the tree, and then curving outwards until its upper end comes to the bark. Here it makes its bed, to repose in during its pupa state. Shortly afterward it reaches the winged state and crawls out of the tree.

Remedies must be applied early. At first the insect may be cut out with the point of a knife. If deep in the wood it may be punched to death in its hole by a flexible wire. To prevent the insect from laying its eggs in the bark, apply a wash of strong soap-suds and flour of sulphur towards the end of spring and early summer; repeat the operation if the rains wash this off.

Says D. L. Tracy, of Longmont: The best remedy against the borer is good soap-suds with a good stout cloth to rub with. Rub the body and limbs until they shine, at least once a week.



THE CHERRY.

AT one of the meetings of the El Paso County Horticultural Society, in the early part of the year 1882, the subject for discussion was the cherry, based upon a paper read by R. T. Crawford, Esq., of Colorado Springs. This paper we give in full, for the reason that but little attention has thus far been given to the culture of this fruit in Colorado, and hence little is known as to the adaptability of our climate to its successful growth:

"The common cherry tree (*prunus cerasus*) is of Asiatic origin, and is, I think, a native of Persia. It was introduced from there to Italy about seventy years before Christ, and about 120 years afterwards was introduced into Great Britain. It is now extensively cultivated in the temperate regions of Europe and America. There are a great many different varieties. Over three hundred are now reckoned in the various catalogues, many of which are worthless for cultivation compared with the new and improved sorts. The branches are spreading, horizontal or slightly inclining upward in the larger class of trees, and dropping in the smaller ones. They are generally divided by nurserymen into two classes, the Hearts and Bigarreaus, or sweet cherries, and the Dukes and Morellos, or sour ones. The former are strong vigorous growers with large leaves, and grow into large spreading heads or tops, and are best suited for the purpose of shade. They produce large heart-shaped sweet fruit, varying in color from a light yellow to a dark purple.

The Dukes and Morellos are of a slow growth, and do not even attain so large a size, but are much more hardy

and less liable to become injured by bursting of the bark, and generally produce bright and round acid fruit. This is the class that is so much esteemed for cooking purposes. On dry soils this class of cherries is considered one of the most profitable fruits grown.

"The cherry will thrive best on a dry sandy or gravelly soil, and 'tis there it will attain its greatest perfection; but it does well in almost any situation excepting a wet one. I consider it one of the most ornamental of all fruit trees, which, with its delicious fruit, beauty and shade, makes it very desirable for planting near dwellings where all three of these objects are so much sought for. The cherry is best propagated by grafting on seedlings of the wild cherry, of which there are several varieties, most of which are too well known to describe (the choke cherry, for instance). The wood is much used in the manufacture of cabinet ware.

"Although both classes are successfully grown in the eastern states, I find that the Duke and Morello class are best adapted to the soil, climate and altitude of Colorado, although I know of several trees of the large class growing on our town site. They are, however in sheltered positions, and receive more than ordinary care. We have on our place somewhat over seventy-five trees growing, all of the Morello class, and all composed of but two varieties which I consider the most profitable and reliable, viz: Early Richmond and Mt. Morency. There are several others of this class that I am satisfied will do well here, as Reine Hortense, Belle Magnifique, May Duke, Late Duke. These are all hardy and similar in growth. I am much pleased with the growth, averaging at least three feet in a season and remarkably healthy and free from blemish. I do not consider the Heart and Bigarreau class safe to plant here yet, although I believe the time will come when they can be successfully grown, for I believe that here, as in other parts of the country, as civilization advances and trees are planted, the climate will undergo a change more favorable to the growth of the

tenderer varieties of fruit. I do not consider that the cherry requires much pruning after the first two seasons, nor then unless it be to form the branches into low and spreading heads; afterward an occasional cutting out of any cross branches is all that is necessary. The best to transplant are two-year old trees, and they are usually from four to six feet in height.

"I find, however, that some parties here have not met with success in making their cherry trees bear. The difficulty lies in forcing their growth by application of fertilizers and water, thus causing a luxuriant growth of wood and foliage, which prevents the formation of fruit buds. After your tree has attained bearing size, cease cultivating for awhile and thus check the growth, and you will find that they will bear you good crops.

"From my own experience and observations I consider the following varieties best adapted to our section and best to plant. The two first-named are much superior in size and quality to the others: Mt. Morency, Early Richmond, May Duke, Reine Hortense, Late Duke, English Morello."

In the discussion that followed the article, Mr. Parsons said that the cherry tree, as a rule, was not as hardy as other fruit trees.

Messrs. Hogue, Crawford, Snyder and others present said that they thought the severity of last winter should not discourage the planting of cherries, as the winter was an unusually hard one on all fruit trees.

It was generally agreed that too much water was the ill that many cherries suffered from; that they needed only about as much water as the grape.

Mr. Crawford said that after cherry trees were in full bearing he thought they should be cultivated very little.

In a communication to the *Denver Times*, Mr. D. S. Grimes comments as follows upon Cherry Culture in Colorado: "Many varieties of the cherry, pear and plum succeed better in Colorado than they do in the western states bor-

dering on the Mississippi Valley. The original stock of the cherry, now multiplied by hundreds, was from the dry regions of continental Asia—a country similar in many respects to our own. The Lieb Cherry, now found as hardy as a crab apple, was brought to this country from the Hartz Mountains in Europe, an interior region near the fifty-second parallel of north latitude.

It is a waste of time and money to plant the Hart, a sweet cherry, in the north. The Dukes are reasonably hardy, of rapid growth, and sometimes bear fair crops of fruit. The Early Richmond is regarded by the entire fruit-growing fraternity, as the one indispensable cherry.

The English Morello is rather a slow grower, but on this account seems hardy as an oak. It comes into bearing the earliest of all, frequently producing fruit the same season it is planted in the orchard. It ripens its fruit two weeks later than the Early Richmond, is of larger size, quite acid, firm in flesh, less juicy than the Richmond, and on the latter account infinitely better for canning than the latter. The color of the fruit is glossy red, almost black, very handsome indeed. For the market it proves very salable and profitable, bearing transportation well. For some reason, probably on account of its acidity, the English Morello is nearly free from the depredations of the birds.

Any one having the early Richmond, English Morello and Lieb, a Plum Stone Morello, in his fruit garden, is as well supplied as the conditions of our climate, summer and winter, will permit.

Cherries, says Mr. Grimes, should be budded on the Mahalel stock. This stock dwarfs the tree and does not sprout, comes into bearing third year from bud, while those on the Mazzard stock commence fruiting in six years, and on the Morello stock in eight to ten years. The latter sprouts from the roots badly.

J. W. Cook says that the cherries belonging to the

Morello family universally do well in Colorado. About every house there should be at least a few trees of this delicious fruit.

Jesse Frazier has succeeded well with the Early Richmond and the English Morello. A sweet cherry, known as the Governor Wood, has given fruit, but he does not think it a success sufficient to recommend it. Mr. D. S. Grimes, however, places it on his list of leading varieties.

Says Mr. A. N. Hoag: My cherry trees are from one to six years old. The little sour Morello stands the climate very well. They require mulching, to keep them back in the spring. Some of my trees are five inches through and ten to twelve inches high. The trees have borne for three years.

W. A. Nelson does not believe that any of the sweet varieties will succeed in Colorado. Has the Early Richmond in bearing. Birds take all the fruit, he says, anyway.

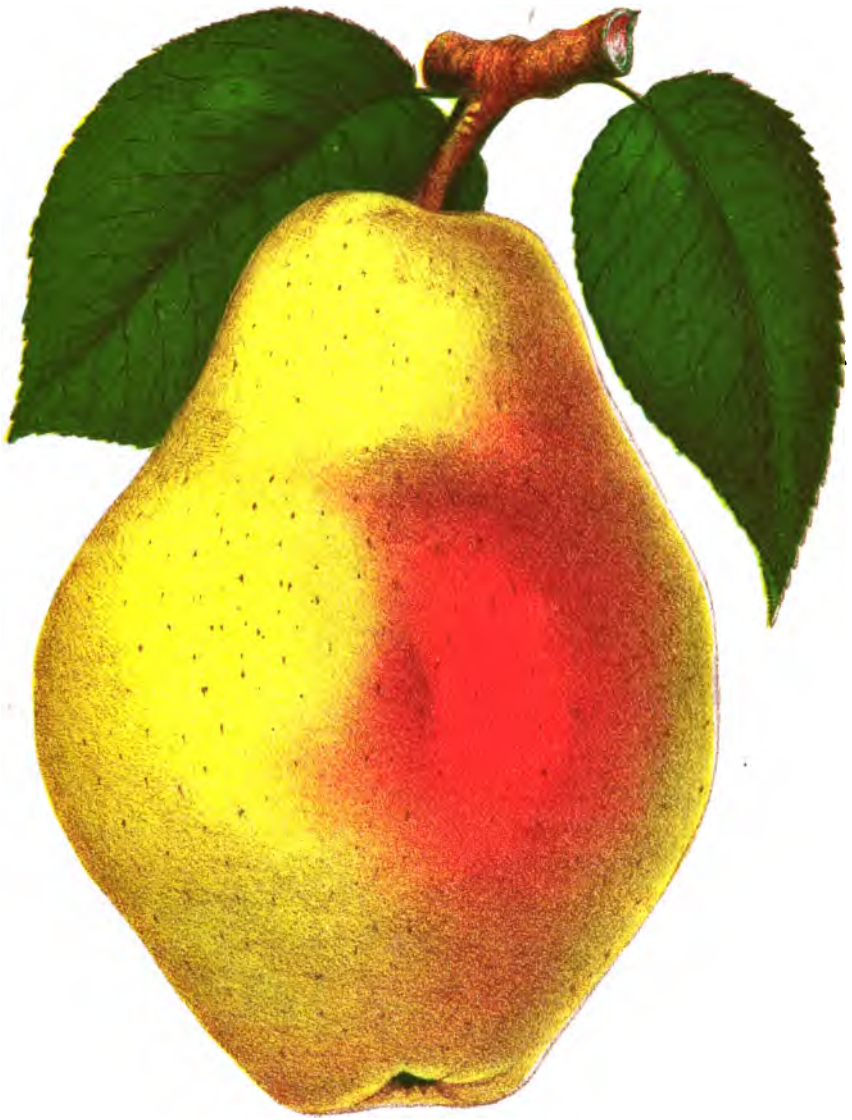
The following are recommended by D. S. Grimes:

Early Richmond.	English Morello.
Lieb Montmorency.	May Duke.
Governor Wood.	

He adds: Rich soil and constant irrigation are destruction to cherry trees. They will not bear high feeding or too much water.

D. M. Rose: I have cherry trees eight years old and bearing excellent fruit. The varieties are Early Richmond and the English Morello.

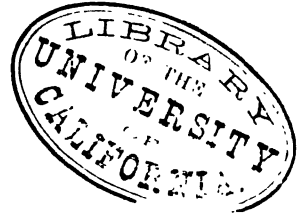




KIEFFER'S HYBRID PEAR.

INTRODUCED AND FOR SALE BY
WM. PARRY,
PARRY P. O., N. J.

PEARS.



INTRODUCTORY.

SAID D. S. Grimes, in one of his valuable contributions to the literature of Colorado Horticulture: "The cultivation of the pear, although much neglected here in Colorado, appears in every particular well adapted to our peculiar soil and climate. Not one case of blight, which is the bane to pear culture almost everywhere, has yet come under our observation * * * * The dwarf pear is coming rapidly into favor. It requires but little room, comes into bearing early, and will live fifteen or twenty years. The term "dwarf," by which pears on the quince root are usually called, conveys to some minds an erroneous impression. It is true the tree is dwarfed somewhat by the influence of the stock, and thus early introduction is induced, but the trees are not necessarily stunted nor very small, for the trunk not infrequently attains a circumference of fifteen or twenty inches. Coal ashes thrown around pear trees is found beneficial to their health and vigor."

The following suggestions are by Mr. J. H. Newcomb: "The pear in the eastern states and California is considered to be fully as, or more reliable, than the apple. It has been fruited here, but not as extensively as the apple. I most heartily recommend everyone that is contemplating planting orchards to at least plant a few pears. That if successful it will bring more money than any other fruit raised, as California is where most of our pears are shipped from that appear in our market, and six cents per pound freight is a pretty good protective tariff for us. The first winter is

where the great danger to our trees lie. I would advise the planting of pears on high, dry ground, early in the spring; cultivate and work; give them a vigorous start early in the season. Do not work among them later than July, so they can go into winter quarters with well ripened, matured wood. Do not manure around them at all, as our ground is generally rich enough for any tree. Late irrigating must be done if required. If the weeds are too bad, pull them by hand rather than plow late in the season. Wrapping the trunks of the trees in November in gunny sacks, not too thick, just enough to keep them on and the sun from scalding them, I think beneficial."

Some one, whose name we cannot recall, has said that "pears will grow as well as cottonwoods. I have not lost one out of twenty-five. A horse ate one to the roots three times, but it grew up each time."

More attention has been paid to pear culture in Southern Colorado than in the northern part of the State; still there is no reason to doubt their success north of the Divide than there is to doubt that of the apple. Pear trees at Greeley have been fruited for several years. Mr. A. E. Gipson writes that they give promise of being a marked success in the valley of the Cache la Poudre; and if there, there is no valley on the eastern slope of the Rocky Mountain ranges where they may not be grown.

VARIETIES RECOMMENDED FOR NORTHERN COLORADO.

By D. S. GRIMES: Bartlett, Clapp's Favorite, Flemish Beauty, Louise, Seckel, Bonne de Jersey, Lawrence and Vicar.

By A. E. GIPSON: Flemish Beauty, Duchess, Bartlett.

By J. H. NEWCOMB: Bartlett, Lawrence, Vicar, Flemish Beauty, Clapp's Favorite, Duchess, Seckel, Buffum, Brandywine, Louise, Bonne de Jersey.

By M. N. EVERETT: Louise, Bonne de Jersey.

The following list may safely be accepted as safe, with our present knowledge of Colorado :

Summer—Bartlett, Clapp's Favorite, Osborne Summer.

Fall—Flemish Beauty, Louise, Bonne de Jersey, Buerre d' Anjou, Duchess de Angouleme, Seckel.

Winter—Lawrence, Winter Nellie, and Vicar of Wakefield.

SOUTHERN COLORADO.

The following opinions are by residents of Southern Colorado :

W. A. HELM : I do not doubt the final success of this delicious fruit in the Arkansas Valley, if not elsewhere. I have fruited for six years the Duchess, Bartlett and Quince pear.

JESSE FRAZIER : I have sixty or seventy pear trees, some planted as long ago as 1868, having trunks ten inches in diameter. I have one pear, the name of which I do not know, which is of small size, is a rapid grower, prolific bearer, and early maturer, ripening the last of July.

D. M. ROSE : I have had very good success in growing pears, and I regard Colorado as well suited to this fruit. I have raised bushels of pears of the standard kind. I prefer the Flemish Beauty to most others, as it has long, slender limbs and ripens its wood better than the Bartlett and some other varieties. Still I have had good crops of Bartletts, though some of this variety have winter-killed with me.

R. T. CRAWFORD : Pears do not do well on very sandy soil. They need a clay soil. I would recommend the following varieties : Lawrence, Sheldon, Flemish Beauty, Winter Nellie.

In the opinion of the El Paso Horticultural Society, dwarf pears were deemed unworthy of attention ; they would not do well, owing to the fact that the bark of dwarf fruit trees was thin and did not winter well.

BLIGHT.

Although at one time, as quoted at the head of this article, Mr. D. S. Grimes said that no case of blight had come under his observation, still we understand that the pear has already suffered from blight in Colorado, and Mr. Grimes has remarked, "of pears thus far untouched by blight I have observed the Seckel, Flemish Beauty, La Bonne de Jersey, and Lawrence," thus acknowledging its presence in some other varieties.

Blight is a disease that spreads rapidly, and unless all limbs so affected are cut off at once and buried or burned, the whole tree is shortly affected and soon killed. Trees with a northern and a southern exposure are alike affected. Blight usually strikes the tree while in full leaf and vigor, causing the leaves and bark on certain branches to turn suddenly black and wither.

DESCRIPTIVE LIST.

SUMMER.

Bartlett—One of the finest summer pears known. Large size; clear yellow, with often a beautiful blush next the sun; tree a strong grower, bearing early and abundantly. Very popular. August and September.

Brandywine—Tree vigorous, upright and productive; fruit medium size; yellowish green, somewhat russeted; juicy, melting, sugary and vinous. August and September.

Osband's Summer—Tree moderately vigorous, an early and prolific bearer; fruit medium, roundish; clear yellow; juicy, melting, with a rich, sugary flavor. August.

Clapp's Favorite, Madeline and others.

AUTUMN.

Buffum—Medium size; yellow, somewhat covered with reddish brown and russet; buttery, sweet and excellent. A stout and upright grower.

Belle Lucrative—Medium size; pale yellowish green;

very delicious, rich, melting; tree strong grower and good bearer.

Burre de Anjou—Large, noble; russety fruit, of excellent quality; one of the best; tree upright; hardy and productive; large, yellow and brown; juicy, good. September.

Flemish Beauty—Tree hardy; bears early and abundantly; fruit large; pale yellow with red cheek; strong grower and good bearer; does well everywhere. September.

Louise Bonne de Jersey—Large; yellow and red; juicy, buttery and melting; excellent; vigorous grower and immense bearer. A fine variety, either as standard or dwarf. September.

Seckel—This is one of the best and highest flavored pears grown. Small; rich yellowish brown; productive, healthy, but slow grower. September.

Sheldon—Medium to large; skin yellowish russet, with a richly shaded cheek; flesh a little coarse; melting, juicy, with a brisk, highly perfumed flavor. A very excellent and promising variety; tree a fine grower, and productive. September.

WINTER.

Lawrence—Above medium; yellow, thickly dotted; with a very rich fine flavor; one of the best; tree a moderate grower, but very productive. October to November.

Vicar of Wakefield—Large, long, beautiful and good; not first quality, but desirable for its productiveness; tree hardy and a vigorous grower. November to January.

SUGGESTIONS—NEW PEARS.

Prof. J. L. Budd, of the Iowa Agricultural College, has been experimenting for the last few years with a number of Oriental pears. These were obtained from Russia, but their original home was in North-Western China. The winter of 1881-82 was one of unparalleled severity in Iowa, hence

the test of these new pears was a severe one. The variety known as Sha-Li, or Sand Pear, Prof. Budd does not think will endure the ordinary winters of the West. The Pe-Li, or Snow Pear, however, he is of the opinion will stand our summers and winters as well as do the Russian apples. He says of the Snow Pear: "The Hon. S. W. Williams, of Salem, Mass., and others who have spent several years in North-Western China, assure us that the varieties of the Snow Pear are globular, white and juicy, and are generally regarded as the best fruits of the country. The varieties we have seen are very upright in growth, and their leaves are nearly as large and thick as those of the Sand Pear. The surfaces of the young leaves, buds and branches are tomentose, and show traces of silken threads or hairs. It has been claimed that William R. Prince grew seedlings of the Snow Pear and disseminated them fifty or more years ago. This may be true, but no specimens I have seen have any resemblance to the true Snow Pear, such as we have from Moscow and the leaves which we have received from Peking. *I have much faith in this pear*, which is common in nearly all parts of Northern Europe and Asia."

Prof. Budd also mentions a variety called Kuang-Li, or Strawberry Pear, from its flavor, which resembles that berry. It is thought that this is the original type from which the Bergamots have descended. He does not, however, consider them as promising as the Snow Pears.

Mr. James S. Springle, of the Province of Quebec, in a paper on Pear Culture in that extremely cold region, gives the following as a relative list of hardy pears, and his opinion is concurred in by Downing, Thomas and Barry:

Doyeune Boussock.

Buerre de Anjou.

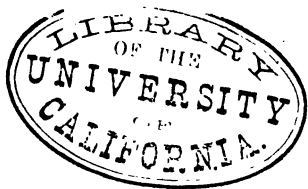
Oswigo Buerre.

Buerre de Capiamont.

The third has already been tested in Colorado and accepted as a favorite autumn pear. It might be that the others named would also suit our conditions of climate and culture. A writer in the *Maine Farmer*, commenting on this

list, adds to it, in addition to Clapp's Favorite and Flemish Beauty, well tested here, two newer kinds, the St. Ghistam and Onondaga.

Keieffr's Hybrid Pear, of which we give an illustration, is a seedling from the Sha-Li, or Sand Pear, and the Bartlett. At the Philadelphia Centennial a prize medal was awarded the originator for producing a pear "of remarkable excellence, giving promise of great value." The fruit is large, measuring ten to sixteen inches around, weighing from ten to eighteen ounces, and very uniform in size. Color, greenish-yellow, some russet; flesh white, buttery, juicy. quality, good; season, October. It does not rot until very ripe, and remains firm at the core to the last. They bear shipment as well as apples. The cut shown was made from a specimen measuring twelve inches in circumference and weighing eighteen ounces. It is believed that they are never affected by blight. We suggest their trial as being suited to our climate.



PEACHES.

PEACHES in Colorado? Well, not yet. On the eastern side of the range for fifteen years lovers of this delicious fruit have tried and tried, and failed and failed, save here and there, in rare instances, a tree has been guarded and tended as though it was an exotic.

We well remember our enthusiasm regarding peaches when we first settled in Colorado. In our Greeley garden there were peach trees as well as other fruit trees planted the first season. We do not remember the variety, but that summer they made a wonderful growth of slender limbs, and the prospect seemed fair that the trees would thrive. The succeeding winter was exceptionally cold; those who were here in 1870-71 will remember it. There lay snow on the ground in the valley of the Cache la Poudre for ninety days. When the warm spring sun came to tempt the cottonwoods to their emerald robing, day after day we watched the peach trees, looking for the coming of the welcome pink blossoms so familiar to childhood's days. Did they come? Bare and brown through the bright spring days the branches stood and never a flow of sap came up into them from the roots.

"Winter-killed," said dear Father Meeker, as he looked at them one April morning. Yes, that was the story. Later, new shoots came up in bewildering profusion and that second summer our peach bushes grew rank. But the succeeding winter killed them down again, and we came to the discouraging conclusion that peach culture in Colorado would never be a brilliant success.

This was ten or twelve years ago, and, unless the new fruit region in Grand Valley, on the western border of our State, of which we are beginning to hear praises and to which enthusiastic fruit growers are turning their attention, should prove more kindly than have the valleys on the eastern slope of the range, we must still look elsewhere for peaches.

Still, let us hear those who have had more or less experience, though the number is but few. We may say that we are only on the border-land of experiment with the peach, and the day may come when its culture will be as easy as is that of the potato.

George W. Webster, of the St. Vrain Valley, thinks peaches cannot be successfully raised in Colorado, on account of the trouble required to cultivate and care for them. He says: "If you keep them trimmed low, pack straw in between the limbs in winter time, and then tie a rope around the tree so as to keep the straw from blowing away, then, perhaps, you may raise peaches. But this takes more time and trouble than the peaches are worth. Some day we may find a hardy kind that will do. Our climate is changing; has changed much since I came here, and may change so peach-raising will be easy and profitable."

This, it will be seen, is not encouraging. In Southern Colorado, in the valley of the Arkansas, they are likely to grow, if anywhere on the eastern slope. We have visited various gardens and orchards in this valley, and have seen peach trees; but they cannot be said to have been in a thriving condition. In the garden of Mr. Anson Rudd we found quite a number growing, and questioning him as to varieties found that they were mainly seedlings. He had twelve varieties, all apparently doing well; some had fruited. He favored starting from seed, rather than introducing young trees, believing that they will acclimate better and not winter-kill so readily. He found the trouble to be this: the late warm fall weather brings out the peach buds, develop-

ing them to such an extent that they become frozen later in the season. Still, he thinks that peaches will average with the Middle States, and should be given more attention in Colorado.

Mr. D. M. Rose, in the Fontaine qui Bouille Valley, a few miles south of Colorado Springs, has some fifty trees on his place, entirely seedlings; some of these have fruited for the last four years, producing very good peaches.

Mr. D. S. Grimes and Mr. J. H. Newcomb give each a list of varieties probably adapted to our climate; but as there are only three named by both, we hardly think it will be safe to name the entire list. The three they agree upon are Hale's Early, Crawford's Early and Crawford's Late.

PLUMS.

IT is not generally known," said D. S. Grimes, in an article on the Fruits and Flowers of the Rocky Mountains, published last year, "that the largest fruit of the native or wild plum is found growing in the mountains and valleys of Colorado and Wyoming. Since we first came to this country ten years ago, our attention has been often directed to the superior quality of both natural and cultivated fruits. Many varieties of the wild plum found here are inferior and unworthy, but once in a while we find among these inferior kinds one that deserves more than a passing notice. In the valleys of the Arkansas, Platte, Boulder and St. Vrain, we have seen varieties of purple-red and yellow plums double the size of the Wild Goose or Miner, with small seed, firm rich flesh, apparently filling the bill of this delicious fruit, plum full.

"In our wanderings along the upper Arkansas we came upon a variety of the plum differing widely from anything we have ever before seen or heard of. This plum was very large, roundish, the skin smooth but spotted with bright red and yellow spots. In this group were eleven trees. The parent or largest tree, measuring six inches in diameter, and about eight feet in height. The branches of all the trees in this group put on a pendulent drooping or weeping character. Whether this drooping of the limbs was owing to the bearing of heavy crops of fruit, the altitude or was the natural growth of the tree we are unable to say, the tree

being a dwarf with a symmetrical and weeping head laden with rich, ripe, spotted fruit as we saw it. Could it be transferred from its alpine home and retain these peculiar characteristics, it would, indeed, be a valuable acquisition to horticulture. The time will come when the origin of some of our finest fruits and flowers will be traced to the Rocky Mountains. The famous Weaver Plum—first found growing near Cedar Rapids, Iowa—was doubtless carried there from the Black Hills by the Indians. The same variety is found in several localities near Custer City and Deadwood."

Plums, therefore, are natives of our country, growing wild among the mountains and among the foothills, but notwithstanding this fact, the old settler as well as the tenderfoot seems to question the practicability of raising plums here. It makes but little difference with the plum whether the soil is rich or poor, wet or dry, cold or hot. It will stand more neglect and exposure and do better than any other tree. The only difficulty experienced in the cultivation of the plum is the curculio. The depredations of this pest make the foreign varieties often unprofitable.

The Miner, Wild Goose, Weaver and Lombard are of the Chickasaw, or native varieties, and are seldom troubled with the curculio. There are remedies, however, for the destruction of this enemy of the plum, as well as for other insects injurious to fruit culture.

The following is by R. T. Crawford, in an address before the El Paso Horticultural Society at a meeting when the plum was the subject of discussion :

"Plum growing in Colorado is as yet in its infancy, although in some sections of the State there are many trees in bearing. It attains its greatest perfection here, as it is entirely free from disease, and the curculio has never made its appearance.

"I do not think that all varieties can be grown here in

El Paso County, but am convinced that the hardier sorts can, such as the Lombard, Gueye, Yellow Egg, Wild Goose and Miner. The last two are improved varieties of the Chickasaw, or wild plum.

"I am most favorably impressed with the Lombard, having some twenty fine trees growing on our place. These are perfectly free from blemish, the bark looking as if it had been rubbed and varnished, and the growth has been rapid and exceedingly healthy. I think they will pass through the winter uninjured. There are several parties who have planted the cultivated sorts and they are doing well, but know of none that have yet fruited, the Lombard and the Gueye being the principal varieties. Of the native plums there are many trees in bearing here. The fruit of some is said to be very fine. While I would not recommend the tender sorts for this climate, I unhesitatingly recommend the Lombard and Gueye, of the improved sorts, and almost any of the natives that are worthy of cultivation, as being safe to plant here, and would say to all fruit growers plant the Lombard first of all for vigor of growth, hardiness and productiveness."

Says J. H. NEWCOMB: "The plum attains its greatest perfection here, being entirely free from disease. The curculio, that dreaded foe of the East, has never made its appearance with us. The plum, as every one is aware, is wonderfully productive, producing heavy crops for a long series of years. No fruit with which I am acquainted seems more promising than this."

E. R. SIZER: My plum orchard now numbers 3,000 trees, 700 of them bearing. Since the first crop they have not failed to bear annually full crops of large, fine, well-flavored fruit. The winter of 1880-81 was particularly severe. The following did not kill down that season with me, and I unhesitatingly recommend them:

Wild Goose.	Yellow Egg,
Miner.	Pond's Seedling.
Blecker's Gage.	Bradshaw.
German Prune.	

D. S. GRIMES: The Weaver, Miner, Wild Goose, Lombard, Jefferson, Coe's Golden, German Prune, are all good and profitable for both orchard and garden. For orchard planting the trees should not be over two years old from the graft or bud. The trees come early into bearing, and the fruit always finds a ready market. The plum is budded on peach stock with much less difficulty than on plum stock. Plum trees budded on peach stock can be purchased of nurserymen for almost one-half the price of those on plum stock, and for this reason nearly all the plums sold over the country by agents are budded on the peach, and are not sufficiently hardy for the north. Plum, on plum roots, will stand almost anything, from an Arctic wave to a street cow. There is no fruit more profitable.

Authorities agree, thus far, as to the entire absence of black knot or curculio, but it is not to be expected that our country will always be so favored. Year by year, as fruit culturists and gardeners know to their sorrow, new enemies make havoc with crops. It is well, therefore, to be on the watch, and to guard against allowing their spread, if once they should appear. Authorities describe the black knot as "a black, puffy, irregular swelling on the twigs and smaller limbs of the tree." The sole remedy is to cut off and utterly destroy all such diseased twigs and limbs *early in the season*; if delayed until late in summer it will not avail; the tree will perish, as the fungus—if such it be—attains its greatest development by this time, and has fatally affected the whole tree.

The Curculio is a small dark-brown beetle with spots of yellow and black. The most simple method of protecting the crop from them is by spreading cloth beneath the

trees as far out as the branches extend, and then giving the tree a sharp blow which will jar off the insects, and, in falling, they are caught on the cloth. They are either killed then, or gathered up with the punctured fruit that has fallen, and destroyed.

Mr. D. L. Tracey, writing upon the subject of fruit culture, remarks: "On tame fruit I have never seen any parasitic plant, but upon the wild plum I have seen what I think is the Dodder plant, but I may be mistaken."

BLACKBERRIES.

THERE is at least one conservative fruit grower in Colorado who is not enthusiastic upon the subject of blackberries. We introduce the subject, therefore, with the assertion of Mr. E. R. Cosson that the reports regarding the growing and fruiting of blackberries in Colorado are so conflicting that he has some hesitancy in advising their planting. Three kinds, the Early Harvest, Snyder and Taylor's Prolific, known to be hardy and successful as far north as Canada, he thinks would do well in Colorado. Other testimony on the subject we group together, as follows:

JOSEPH WOLFF: Only two, of all the varieties that have been tried in Colorado, are worthy of cultivation—the Wilson and the Snyder. Some think only the first named is reliable. It is large, of excellent quality, and can be recommended for the general adaptability to the conditions governing the cultivation of this sort of fruit in Colorado. The Snyder is claimed by some to be perfectly hardy, but it is not.

W. F. WATROUS: I grow the Kittatinny, the Wilson, the Schneider and the Lawton. I deem the latter a very prolific variety, and the one most profitable for Colorado.

A. E. GIPSON: The Kittatinny, Snyder and Wilson's Early are the berries principally cultivated in Greeley. Each does well under proper treatment.

J. M. COLBURN: We have all heard that certain varieties of blackberries would stand our winters without killing down. I do not believe that any variety will. I have set out the Snyder, probably the hardiest of the blackberries,

but it has killed down with the others. I believe that the bushes should be allowed to grow without fall pruning. They could then be laid over without danger of breaking, and covered. In the spring shorten the bushes and grow lateral branches.

A. N. HOAG: I grow the Wilson, Snyder, Kittatinny and Lawton. I never fruited them so long as I left them unprotected through the winter. I now cover with earth. They are now succeeding with me.

D. M. ROSE: I give the preference to the Snyder.

MR. CURR: It is the common belief that heavy mulching and irrigation during fall and early winter will keep blackberries alive. This is untrue, from the standpoint of my own experience. I have done so, and lost heavily. I am satisfied they must be covered with earth or other litter.

HENRY McALISTER: All blackberry canes must be covered with earth in winter, or they will kill to the ground in nine cases out of ten. The hardiest varieties need this protection.

W. A. HELM: The Wilson is a good berry, but it will not stand the winter without covering. The Missouri Mammoth variety will, and is therefore preferable.

E. R. COSSON: The Snyder seems to succeed the best, thus far, of any variety tried in Colorado. The Early Harvest ripens three weeks earlier than any other variety; it is as hardy as the Snyder, but not of as strong growth. The Taylor's Prolific is, from all accounts, a splendid variety, berries large and melting, without core, very productive, and said to be hardy.

J. H. NEWCOMB: Wilson's Early is the kind mostly raised here and discarded to a great extent east for lack of hardiness, which is of no account to us; the large size and luscious fruit is what we want, and we will take care that they do not kill in winter, by bending down and covering them.

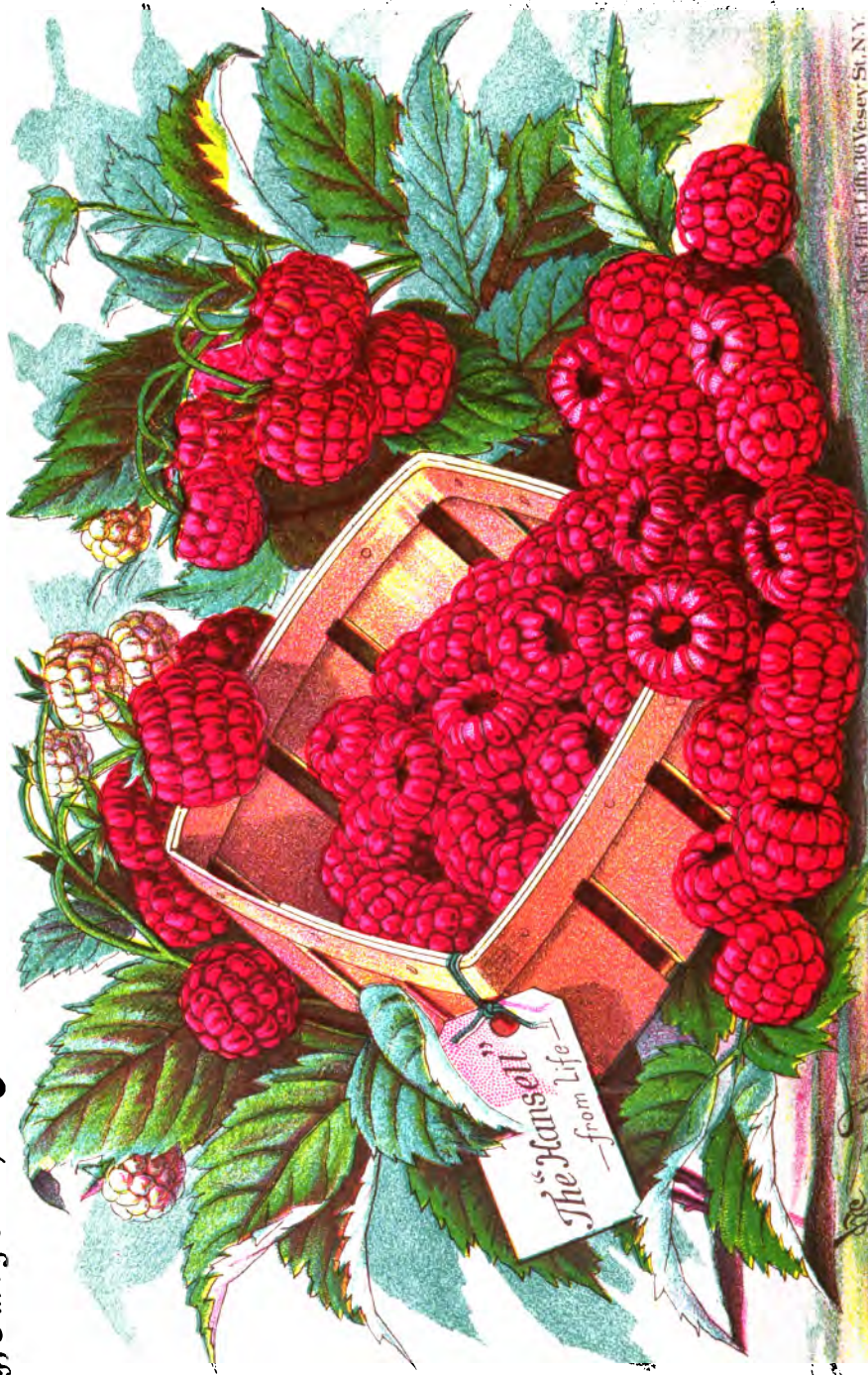
TREATMENT.

J. H. NEWCOMB: Plow deep furrows with two or more horses, after your ground has been properly prepared as you would do for any farm crop, and you have marked off your distances the other way by which to set; straddle the row; if furrow is not deep enough to set your plant as deep as you would like to set it, dig the holes deeper; set your plant, draw the loose earth to it either with your foot or other hand, holding on to the stem with one hand till its position is gained to suit you; tread it firmly, and you are done for the present. Cultivate the same as you would corn. The pinching back had better be dispensed with on account of giving them too much stockiness to bend down. In October bend down and cover entire with earth.

My plan of uncovering in the spring is to take a rake, go along and rake the loose dirt off to expose part of the wood, then leave it a few days, after which take the handle of rake or fork, put it under the curve, gradually working it toward the ends, then raise it. If you want to still protect them a while, let the dirt remain, afterwards raking it level. This will give it a pretty fair start, after which you can cultivate and irrigate as required.



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THE EARLIEST RASPBERRY IN EXISTENCE AND UNSURPASSED IN OTHER RESPECTS.



RASPBERRIES.

THESE are splendidly successful in Colorado. Northern and Southern Colorado tell the same story as to their easy culture, prolificacy and profit. In an address before the El Paso County Horticultural Society, last winter, Mr. E. R. Cosson was enthusiastic as to the berry. Others have also written in its favor. As to varieties, we group together some opinions from those who have given attention to them.

A. E. GIPSON: Of the reds, the Clark is the best known, but the Turner is considered hardier. The leading Black Caps are the Gregg, Mammoth Cluster and the Doolittle. They rank in the order given.

W. F. WATROUS: I cultivate the following varieties, but think the Gregg the best suited for Colorado. Doolittle, Imperial, Mammoth Cluster, Gregg, Davidson's Thornless, Brinkle's Orange.

A. N. HOAG: My favorite is the Doolittle improved, which I consider the standard variety for Colorado. From 700 two-year-old plants I have gathered one thousand quarts of berries. I consider it specially adapted to our climate, as the bushes stand our hardest winters unprotected.

H. G. WOLFF: The earliest to cultivate are the Black Cap varieties, which require no protection on the uplands, and with good cultivation produce abundant crops of fair fruit. The Gregg and the Mammoth Cluster are the only two worthy of cultivation in Colorado. The first has grown berries, four of which placed on a rule measured three and

a half inches in diameter. The red raspberries are the only ones that possess in an eminent degree the essential qualities of a first-class fruit. The Turner is the hardiest of all; it stands hard winters, produces well, and is easily handled. Clark and Philadelphia are also good. The Cuthbert is said to be the coming raspberry of the country.

J. H. NEWCOMB: In a long discussion at one of the sessions of the El Paso Horticultural Society touching the raspberry, a gentleman thought the Clark was the best red berry that could be grown in Colorado. It was tender, however, and must be buried in the winter. The Gregg was the best Black Cap.

The following experience by Mr. A. N. Hoag, as given at a Farmer's Institute held at Fort Collins, covers the ground so completely that we give it entire:

"As I have been called upon for an article on 'Small Fruits and Their Culture,' I will say that I can only give my own experience, which is very limited, being but an amateur. I have succeeded well with raspberries, strawberries, currants, gooseberries, and a variety of other fruits. Six years ago the grasshoppers left me four plants of the Doolittle Imperial Raspberry, which were very much injured, from which I have propagated until I have a half-acre of as fine bushes as you would wish to see, besides selling about 2,000 plants. Those of my own setting have been very remunerative for the past two years. Although the hail of the 24th of last May cut me short at least two-thirds of a crop, I picked as high as 101 quarts of fine berries at a picking, which brought me 35 cents per quart at wholesale. My mode of setting has been varied. Some of them I set 6x8, others 6x6, and others 4x4 feet apart. Those set six feet apart are more easily worked and picked, and, on the whole, are more remunerative. Those only four feet apart are too much crowded, are unhandy to get among to pick or cultivate. Still, there are some advantages in close planting, as the bushes protect each other from the

dry winds and scorching sun of July while ripening, and keep the ground shaded, which retains moisture longer than if exposed to the rays of the sun, thereby causing the fruit to fully develop while ripening, making large, fine, sweet berries, some being fully three-fourths of an inch in diameter. I should not recommend them to be set nearer than 5x6 feet, as the Doolittle is a strong grower. My mode of culture is to lay them down in the fall and cover with earth. Although quite hardy, it pays to lay them down and cover. In the spring—not too early—when all danger of their being killed is past, I take them up, manure at the foot if necessary, then let them stand until the weeds start, when I stake the vines to one side, and turned the way I want to cultivate them. I run through as many times as necessary to mellow the ground with a double-shovel cultivator. Should the ground be too dry I irrigate before plowing. This is all the plowing they get, but when they get weedy I go through them with hand and hoe. I irrigate as often as necessary, using my own judgment when to do so. Raspberries and strawberries require more water on my land than any other fruit. Raspberries do not require as much manure as other shrubbery. I also have the Greggans, Tyler and Mammoth Cluster for black caps. The latter are worthless on my grounds. I have the Brandywine and Turner for reds, and like them more as I become better acquainted with them. Also have the Golden Thornless, which I cannot recommend for general use; still, I say, plant a few for a variety."

Messrs. Crawford & Chase, of Colorado Springs, have two acres of raspberries. They have fruited the following varieties: Turner, Queen of the Market or Cuthbert, Reliance, Brandywine, Herstine, Belle de Fontenay and Highland Hardy, of the red varieties; and Doolittle, Mammoth Cluster and Gregg of the Black Caps. Their favorites are the Turner, Reliance, Belle de Fontenay and Gregg.

NEW VARIETIES.

Lost Rubies (red).—Will endure, it is said, winters when the mercury marks twenty degrees below zero. Is of immense size.

Reliance (red).—Will grow and fruit in all kinds of soil, and gives promise of being more popular. Very successful thus far in Colorado.

Superb (red).—The following points of merit are claimed for this: Berries averaging, in the flush of the season, about six to the ounce; a rich, sprightly, sub-acid flavor; bright crimson color, wonderful productiveness, fruit ripening as early as the earliest and continuing until late in September; strong, vigorous canes and almost thornless; great hardiness, "having withstood the trying ordeal of the comparatively mild but changeful winter and spring of 1879-80, so destructive to some other varieties, and the long and severe one of 1880-81, with the loss of scarcely a cane out of several thousands."

Shaffer's Colossal (black).—Suited to all kinds of soil; ironclad in hardiness, surviving severe winters unprotected. Claimed to be the berry for the extreme west.

Souhegan.—It is said of this that the canes are very vigorous, branching quite freely, with many strong, sharp spines. The fruit is jet black in color, large size and good quality, very productive, and ripens one week before the Doolittle, and with the late varieties of strawberries.

THE HAMELL, of which we give a colored plate, is said to be perfectly hardy. Wm. Parry, of Parry, N. J., says of it "I think it will be an acquisition among small fruits, coming in earlier than any raspberry. It stands single and alone and above all competition. At the present time I think there is no raspberry that can compete with it in all the qualities that are desirable for a raspberry."

CURRENTS.

THE currant is growing more and more into popular favor.

It is easy to cultivate; it is constant in productiveness; it is readily marketed; its season is a long one; it has a long life, lasting thirty years or more when a plantation is properly cared for. It is easily propagated, and, though amply repaying good cultivation, will thrive even if neglected.

Here in Colorado, its enemy, the currant worm, is not yet known. We say yet, because we do not assume that it never will be known. We hope it will not.

Currents, says Mr. E. R. Cosson, delight in cool, rich, moist soil, and always do well on the north or east side of a fence or a hedge. Plant about three feet apart, in rows four feet wide. Do not be afraid to prune. Six good, strong branches will produce larger and better fruit and more of it than a dozen weakly shoots. Mulch thoroughly and keep the soil mellow, and a large crop is assured. If the currant worm should put in an appearance, treat him to a dose of hellebore water—one ounce of hellebore dissolved in an ordinary pail of water, is about to his taste.

Messrs. Crawford & Chase have several thousand of currant bushes on their place at Colorado Springs. The larger part of these are of the Cherry and La Versailles varieties, with some of the White Grape and Market Queen.

Red, white and black do equally well in Colorado. Indeed, why should they not, when they can be found growing wild, yielding large fruit, in our canons and along the banks of some of our creeks?

It is not advisable to set out bushes in the autumn, in Colorado. Our own experience leads us to give this advice. In the spring of 1881 we set out two hundred bushes, whose growth were not retarded in the least, that bore well during the season of 1882. In the fall of the first-named year we set out one thousand plants, of four varieties. The winter was a fairly mild one; there was not much wind, and yet not fifty of the bushes gave out leaves in the spring of 1882. About 100 were utterly killed. The balance sent up fresh shoots from the roots; but our currant plantation has been set back one and perhaps two years, all because the bushes were planted in the fall. Hence we say, better heel in and cover with dirt if you have bushes to set in the fall, than subject them to our winter climate before any growth has been made. And this advice, we are inclined to think, will be equally good if applied to blackberries, raspberries, and strawberries.

The varieties of currants, being so few, are well known and hardly need be repeated here. Still, we give the list, as to earliness.

Red.—Red Dutch, Cherry or Versailles, Victoria.

White.—Grape, Goudoin, Danals.

Black.—Black Naples.

NEW VARIETIES.

Fay's Prolific Red, Leiz's Large Black, Golden Champion.

Though, as before stated, we have no currant worm to trouble us, it might be as well to be prepared for such an enemy by having at hand a statement of the methods used elsewhere where the worm is troublesome.

Soapsuds is recommended; and this is simple enough and easy to be procured. A Mr. Hurlburt, of Portland, Mich., says he knows by two years' successful experience that a dash of soapsuds is death to currant worms. "Try it," he writes to the *Fruit Recorder*, "in just such strength as will cure them in a second of time." He uses it very

strong, and after it has served this purpose the rains wash it down and it acts as a stimulant to the bushes.

We find the following among our memoranda on this subject, and quote it entire, though we do not know where to credit it:

"A new, cheap and effective insect remedy is being tried with good success at the agricultural college at Amherst. It is composed of one part muriate of potash diluted in 1000 parts of water. Applied with a syringe to currant bushes, cabbages, etc., it is death to the bugs and worms every time. The mixture is not only a good insect destroyer, but even if it gets on the fruit and vegetables we are to eat, it is a harmless saline, possessing none of the dangerous characteristics of Paris green, London purple, hellebore, etc. Moreover it is very good as plant food, and what falls to the ground is of service in this way. It is also very cheap, easily mixed and applied. The large proportion of water is necessary because it rapidly evaporates when applied, and so makes the solution stronger."

GOOSEBERRIES.

ENGLAND is apparently the home of the gooseberry. "There," says a recent writer in the *Canadian Farmer*, "the fine, large, handsome varieties they successfully grow are almost endless; but to attempt to reproduce these under our conditions of climate, would only result in disappointment and total failure."

Some of these English varieties undoubtedly will do well in Colorado. We have but little testimony to produce in this connection, as the general cultivation of this fruit has not been attempted. But in El Paso County, on sandy soil, W. H. Bush, of Colorado Springs, has raised berries of the White Smith and Crown Bob varieties, that for size and quality are not often—it is said—exceeded in the great gooseberry districts of England and Scotland.

Mr. A. N. Hoag has three varieties—the Houghton, Wentworth and Downing. The Houghton, he says, is hard to beat. It is very hardy and prolific.

Mr. H. G. Wolff says: The Houghton Seedling is the principal variety grown in Colorado; but the Downing, Smith's Improved and some of the English sorts will do equally well and pay much better than the Houghton.

Says J. H. Newcomb: The fruit is gaining in popularity and importance every year; the demand from our mountain towns cannot be supplied for years. The Houghton is the most extensively planted and perhaps the most produc-

tive, but there is no reason why we cannot raise the larger improved varieties of our own and also the large English sorts, as we are never troubled with mildew here. They can, by the use of gloves, be gathered in half the time required by any other variety of small fruits.

SUGGESTED VARIETIES.

Smith's Improved.

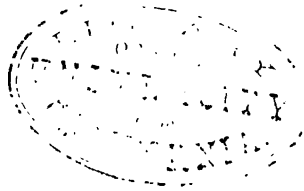
Downing.

Houghton.

Oregon Seedling.

White Smith.

Crown Bob.



STRAWBERRIES.

WE are told by Shakspeare that a garden in Holborn produced strawberries in 1483. In 1578 the berry was known as the Wood or 'White Alpine Berry, because it grew in shadowy woods and highway sides, wild. As late as 1660 no other variety was known. In 1665 two are found having names—Virginia Scarlet and the Bohemian, supposed to be the Hautbois. Up to this time no effort to grow new varieties from seed or by crossing had been made. The wild strawberry, as God made it, was good enough for humankind.

About this time Fressaut, a Frenchman, produced a variety called the Clapperon, from seed of the Wood Strawberry. From that time until the beginning of the present century but little attention was paid to obtaining new varieties. In fact, not until 1834, when Hovey's Seedling came into existence, was any progress made in America, at least; these, in alternate rows (being a pistillate variety) with wild strawberries, were found to produce a very fine crop of large and delicious fruit. Now there are about five hundred varieties named, while thousands have been raised and rejected after a year or two of trial, as unworthy of propagation or naming.

Strawberries do well in almost any kind of soil, in Colorado; though light, sandy loam seems to be best adapted for the majority of varieties. Later we will give a list recommended for the various kinds of land we have, grouping them for light and heavy land. It is probable that there is no soil in the State, except where it is habitually wet, under

an altitude of 7,000 feet, that will not grow some kinds; as we have known them to fruit bountifully at an altitude 500 feet higher than we have named.

CULTURE.

E. R. COSSON: When the plant arrives, should the ground not be ready or the weather unfavorable, take them from the package, loosen the branches, dip the roots in water, and put them in a cool place away from the sun, wind and frost. Moist but well drained land is the best for the strawberry. Avoid the shade of trees. The soil should be thoroughly and deeply pulverized, and fertilizers used freely. The size and number of berries will be in almost exact proportion to the cultivation and fertilization given. In setting, do not plant deep, but press the earth very firmly about the plants. Do not plant on a windy day. The earlier plants are set, the better; always. For hill culture, plant in beds four feet wide, with alleys two feet wide between them. Plant in each bed three rows of plants fifteen inches apart, and the plants the same distance apart in the rows. For the matted row system, plant in rows three feet apart, and the plants a foot apart in the rows.

H. McALISTER, JR.: I prepare the ground for strawberries with great care, manuring it heavily and digging it over several times, thoroughly incorporating the manure with the soil. I set the plants in rows two feet apart and about a foot apart in the row. In a year or two I allow the plants to thicken up in what E. P. Roe calls the matted row system. The beds are carefully mulched every autumn, or rather early winter, with leaves or long manure, scattered very thinly over the whole bed. If properly cared for, a plant will bear heavy crops for four or five years, although most growers will find it profitable to renew every third year. I keep leaf mould or other fine mulching around my plants during the bearing season.

It is said that for every runner that is cut off, a fruit

stem will form on the old stock, and that as many berries and of as large a size will be obtained from the one hill as would have been had the runners been allowed to run over the bed at will. This has been proven true in Minnesota and elsewhere, and is likely to be so in Colorado. Varieties like the Crescent Seedling, that are so profuse in runners, will stool out wonderfully when the runners are kept off; the more they stool out the more fruit stems; hence greater the crop.

The hill system and the row system each have their advocates.

Joseph Wolff says: I grow in the hill system principally, three feet between rows and twelve or fifteen inches between plants in row, removing all runners as soon as they make their appearance. Grown in this manner they attain a very large size, are more readily cultivated, command the highest market price, and pay a larger profit than to let them run.

Wm. Newland's system is in rows three feet apart and one foot in the row.

A. N. Hoag sets his still farther apart—four feet between rows, eighteen inches in the row, throwing up a ridge to set the plants on so that water will run between the rows. Cultivate often to keep weeds down, except while fruiting. The first year he grows onions or early peas among the plants, the profit of which generally pays for cultivating.

Wm. Newland prefers clay loam to sandy land. He says he raises more and larger berries on such land. Yet the rich sandy loam of such sections as the town site and vicinity of Colorado Springs have been found to be admirably adapted to the production of the largest and best strawberries. At the meeting of the El Paso Horticultural Society, held in Colorado Springs in June, 1881, thirty varieties were shown, the display far exceeding that shown at the fair of the State Society held in Denver shortly afterward.

As regards irrigation, abundance of water is required up to and including the fruiting season. All cultivators agree in this; the more the supply of water the larger the berry and the greater the crop.

VARIETIES.

Almost every variety has its faithful defenders. But, in fact, we can hardly go amiss in selecting among the older and well-established varieties. The Wilson, as a market berry, here as elsewhere, can hardly be surpassed. In the east, among a hundred claimants for popular favor, it holds its own; and though we have heard of one grower, at least, in Northern Colorado who has discarded it to the extent of giving plants away to those who would take them up out of his ground, in order to make way for a better variety, still one is apt to think that this bed of Wilson must have suffered from neglect rather than because it was an inferior berry. In the last edition of the Fruit Catalogue of the American Pomological Society, the Wilson is reported upon favorably from thirty-six different states, and double-starred, or highly recommended, in twenty-seven of them. Charles Downing stands second and Triomphe de Gand third in the list. After these the following stand in the order named: Kentucky, Longworth's Prolific, President Wilder, Green Prolific, Agriculturist, Hovey's Seedling, Downer's Prolific and Nicanor. In Minnesota Wilson leads the list, followed by Charles Downing, Downer's Prolific, Green Prolific and Crescent Seedling.

We group together the opinions of various fruit culturists in Colorado as to varieties, as follows:

H. McALISTER: I would, for this section, select them in the following order: Cumberland Triumph, Miners' Great Prolific, President Wilder, Sharpless, Triomphe de Gand, Monarch of the West and Jucunda. The Wilson and Crescent are very prolific, but are only regarded as good by those whose tastes have been ruined by rum and tobacco.

I think the Cumberland Triumph is the best strawberry ever grown.

This is rather hard upon the Wilson, for which we profess a fondness, though our taste, as those who know us can easily believe, has not been ruined by "rum and tobacco."

A. N. HOAG: I name the following as varieties to which I am partial, having fruited them all to profit: Wilson, Jucunda, Sharpless, Captain Jack, Crescent Seedling. Others do well with me, such as Metcalf, Prouty, Golden Queen, Lenning's White and Glendale.

WM. NEWLAND: The Wilson and Jucunda are the best berries.

H. G. WOLFF: Of varieties there are so many really good ones that it is difficult to decide which is really preferable. Jucunda and Wilson have proven best with me, so far as tested, under all conditions. Sharpless promises well, as do also Crescent Seedling, Glendale, Duchess, and others. For profit I prefer the Jucunda.

A. E. GIPSON: The varieties mostly cultivated in Greeley are the Jucunda and Wilson. Recently the Sharpless has come into great favor, and is being largely planted. The Crescent yields well, but the fruit is not so good in average quality nor in size as the others mentioned. The Bidwell promises to be a formidable rival to the others, and I shall not be surprised if it proves among the very best of strawberries for general cultivation.

R. T. CRAWFORD: Our soil is somewhat heavier than that generally found on the town site of Colorado Springs, being mixed with adobe. During the past season we have marketed many thousand boxes of strawberries of the following varieties: Crescent, Wilson, Glendale, Sharpless, Charles Downing, Miners' Great Prolific, Jucunda, President Lincoln, Pioneer, Kentucky, Duchesse, Black Defiance, Russell's Advance, Forest Rose, Bidwell, Seth Boyden, Colonel Cheney, Panic, Great American and Monarch of the

West. During the coming season we will add the Triomphe de Gand and Cumberland Triumph to our list. We are pleased with all the above, excepting the Forest Rose and Panic, which I will discard in the future. At the State Horticultural Society fair last June we took three first premiums for our strawberries. Some of our Sharpless measured six and a half inches in circumference.

This last statement we can vouch for, having seen with our own eyes, in common with hundreds of others, this wonderful plate of Sharpless berries exhibited by Mr. Crawford, who, with his partner, Mr. Chase, has six acres in fruit. They are probably the largest growers in the State.

LIST FOR LIGHT SOIL.

Early—Bidwell, Wilson, Crescent Seedling.

Medium—Jucunda, Charles Downing, Miner's Prolific.

Late—Kentucky, Mount Vernon.

FOR HEAVY SOIL.

Sharpless, Windsor, Glendale, Duchess.

WINTER PROTECTION.

The following essay on Mulching, by Henry McAlister, Jr., of Colorado Springs, read at one of the meetings of the El Paso County Horticultural Society, so completely covers the ground on this subject that we give it entire:

"To mulch, in the language of the lexicographer, is to cover with half-rotten straw or other litter.

"In the cultivation of the strawberry the best results can only be attained by carefully mulching the bed in winter. It is quite essential that young plants—those a year old or less—should be mulched; old and vigorous plants, the foliage of which nearly or quite covers the ground, will do fairly well, during ordinary winters, without mulching, but even they are greatly benefited by it.

"The chief object of mulching is to prevent the alter-



nate freezing and thawing of the ground, which disturbs or breaks the rootlets of the plants. This greatly lessens their productiveness and retards their growth. It should be remembered that mulching is not to keep the plants warm, nor to keep the frost out of the ground; it is rather to keep a uniform quantity of frost in the ground.

"It is well not to mulch a strawberry bed until the weather gets so cold that the ground freezes every night; up to that time the plants, if properly cultivated, grow more or less. Before mulching, the ground should be irrigated, and it is probably better to put on the mulching when the ground is frozen. Snow itself is as good a mulching as can be devised. When the snow disappears the ground will be in admirable condition for mulching without further moistening. During a long and very dry winter the ground should be wet once or twice, either by ordinary irrigation or by sprinkling with a hose. This can be done without disturbing the mulching, otherwise the ground will become so dry that the plants will be greatly injured or destroyed.

"Almost any kind of litter will do for mulching. Leaves, which can be gotten in Colorado Springs, Greeley and some other towns in Colorado, plentifully every autumn, answer well. A covering of an inch or two of sawdust serves a good purpose; but probably the most convenient mulching is long horse manure, which can generally be obtained for the hauling. If carefully preserved the same lot of mulching will do for two years or more. Care should be taken not to allow heavy lumps of manure to be immediately on the plants. The mulching should be placed on the strawberry bed in sufficient quantity only to cover the ground—to carefully shade it from the sun's rays. To undertake to give the proper thickness of the layer of covering would be likely to mislead, as an inch of sawdust, or even half an inch of wet leaves raked out of the ditches, would as effectually shade the ground as three or four inches of light, loose straw or hay. The object desired is to completely

screen the ground from the rays of the sun, and no more covering than is barely sufficient to do so should be put on. In most cases inexperienced persons put on too much, and by so doing smother the plants. Better not mulch at all than mulch too heavily. It is well to put the mulching uniformly over the bed; on, as well as around the plants. Whatever is put on must be kept from blowing away by the use of poles, boards, fine manure or earth thrown upon the mulching between the rows of plants. Leaves are particularly liable to be blown off unless thus weighted. In the east, where material for mulching is sometimes scarce, earth is frequently hoed upon the plants as a protection. This answers a purpose, but it is troublesome to remove in the spring. The winter mulching should remain on the strawberry until the plants start to grow in the spring.

PROFIT IN STRAWBERRIES.

After the first year, the following is a fair estimate of the profit in raising berries:

ONE ACRE—EXPENSE.

Irrigation and Cultivation	\$50 00
Picking—2,500 quarts at 2½ cents	62 50
Baskets, Boxing and Marketing	50 00
Commission, 10 per cent.	50 00
Total expense	\$212 50

RESULT.

2,500 quarts, averaging 20 cents	\$500 00
Balance of profit	287 50

Mr. L. K. Perrin, however, who is one of the oldest fruit growers in Colorado gives a better showing even than the above. He says that \$550 worth of strawberries can be gathered off an acre of ground in one year; that it costs to cultivate one acre about \$50 per season; that three cents per quart for picking and about ten cents per quart for boxing and preparing for market, and that the entire cost for cultivation, water for irrigation, picking, boxing and shipping to market does not cost over \$150, leaving a net profit of \$400 per acre.

Let us see how this compares with the cultivation in the East.

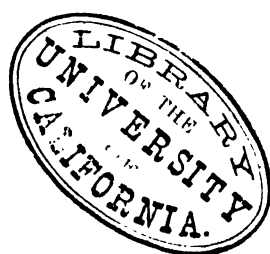
Mr. William Parry, of New Jersey, gives his testimony as follows:

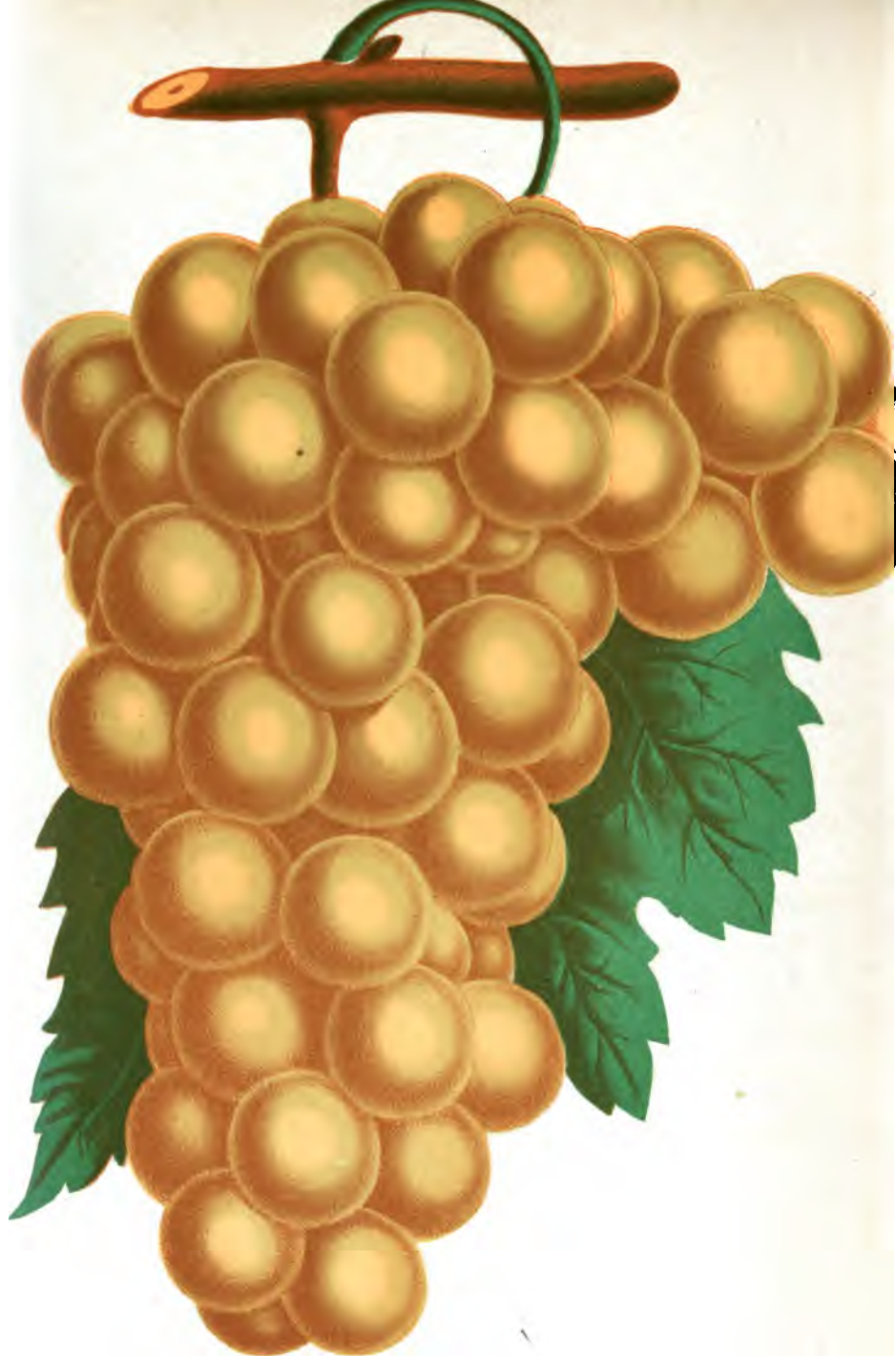
"There are so many circumstances connected with strawberry growing, such as varieties, soil, climate, location, markets, and the skill and management of the grower, that the results of a few cases cannot be relied on for general rules.

"We have grown over two hundred bushels per acre here, and realized upward of six hundred dollars per acre for the crop; but that is much above the general average. Having kept a careful record for fourteen years past, of the yield per acre and price per quart at which our strawberries have been sold, we find the average to be about 2,500 quarts per acre, and the price eleven cents per quart in market, giving the following results:

Commissions, 10 per cent.....	\$27 50
Picking 2,500 quarts, at two cents per quart.....	50 00
Manure	17 50
Use of Baskets	10 00
Cultivation, etc.	25 00
Net profits per acre.....	145 00
Gross proceeds, 2,500 quarts at 11 cents.....	\$275 00

These figures, compared with ours, speak for themselves, and need no comment of ours to "point the moral or adorn the tale" of strawberry culture for profit in Colorado *versus* the East.





THE "GOLDEN" POCKLINGTON GRAPE.

MADE & PHOTOGRAPHED BY HENRY L. V.

This fine, showy and hardy grape was originated from seed by John Pocklington, at Sandy Hill, Washington Co., N. Y. Is an iron-clad variety, having large leathery foliage, (identical with that of the Concord,) which will not mildew in the most adverse seasons. The vine is a strong grower and very hardy; clusters large and showy, weighing as much as one pound each. Quality sweet and good. Ripens with the Concord.



GRAPES.

INTRODUCTORY.

THE grape, like the apple and the fig, appear in history away back into that past era of which we have but faint glimpses in human records. It does not appear in the narrative connected with the Garden of Eden, and this may be set down to its credit. It was very much later in the chronology of the earth that the fruit of the grape made trouble in the family of Noah. Subject to abuse it can work injury; but its proper use makes it one of the blessings conferred upon mankind by an indulgent Creator.

It is not within our present purpose to go into a detailed history of this luscious fruit. By way of introduction it might not be amiss to name the various species as follows:

Vitis Labrusca.—This is the ancient Latin name for the Wild Vine. From this species have come the table grapes of the North, such as the Concord, Catawba, Ives, Martha, Champion, Niagara, Pocklington, Prentiss.

Vitis Aestivalis is the summer grape, whose home is in Missouri, Kansas, Arkansas, and the Indian Territory. Cynthiana and Herbemont belong to this species.

Vitis Cordifolia designates the family of grapes to which the Clinton and Elvira belong.

These two last are the true wine grapes.

Vitis Vulpina is the Southern grape, of which the Scuppernon is the type.

Vitis Vinifera, the foreign or California varieties.

In an address before the El Paso Horticultural Society last winter, on the Care and Culture of the Grape, Mr. W. M. Gumm made the following remarks: "Here in Colorado

grape growing is yet in its infancy, but I firmly believe that in time, on the banks of our streams and in the foothills, we have a section that will rival many of the now considered favorable locations, even California itself. Our State should become the most favored vineyard of the world, for all along our streams they are found growing in great profusion—along the banks of the Platte, Arkansas and Big Thompson rivers, and Fountain, Cherry and Grape creeks; also in the canons and mountain gulches."

CULTURE.

V. DEVINNY: Upland soil is best for grapes. It must be deeply and well ploughed, thoroughly pulverized and smoothed by harrowing or rolling. If the soil is old and worn out, well rotted stable manure should be applied; fresh manure should be avoided. Put bones in the holes prepared for the vines, if possible, for their needed supply of phosphates. Set vines in rows eight feet apart, several feet apart in the row.

R. T. CRAWFORD: I prepared the ground for my vineyard in the following manner: Holes two feet square and three feet deep were dug, in rows eight feet apart and six feet apart in the rows. In these holes were first put about nine inches of broken bones, upon which was put about three inches of well-rotted manure. Then the holes were nearly filled with surface soil, leaving a mound in the centre upon which the roots of the vine were spread, in as natural a position as possible. The holes were then filled up, leaving the crown of the vine on a level with the surface.

A. N. HOAG: My grapes are set 8x8 feet and I cover with earth where the vines are small, but when too large I lay them on the ground, laying anything which comes handy on them to hold them down.

J. WOLFF: With the grape don't make the mistake of planting on low, moist ground to save the trouble of irrigating. They should be planted on dry ground so that the

water may be withheld when the fruit is ripening so as to insure early maturity.

J. H. NEWCOMB: Plow furrows where you want your grapes; if not deep enough dig your holes the same as recommended for apple trees and treat the same way.

NO MILDEW KNOWN IN COLORADO.

Says VALENTINE DEVINNY: Owing to the structure and nature of the leaf of the grape vine it is especially subject to mildew, mould, rust or smut, all of which are synonymous terms for various forms of a parasitic plant, living upon what it infests. Mildew is brought into existence and propagated by a moist atmosphere and is destroyed by a dry one. Therefore mildew, and especially grape mildew, can not exist to any great extent, if ever, in our Colorado climate. Though a cultivator of grapes for over twelve years, yet I have never seen rust or mildew in my vineyard. This goes to show that we possess one of the best climates in the world for grape culture; a climate not only suited to the hardy coarse sorts, of the fox grape variety, but the finer foreign sorts also, such as the Muscats, Hamburg and and Chasselas' Frontignans.

GOOD EFFECTS OF IRRIGATION.

V. DEVINNY: The grape requires less water than almost any other fruit. It is a notable fact, which thus has a direct bearing upon this matter, that all grape-growing districts throughout the world noted for the production of grapes or wine in their perfection, are favored by an arid climate where agriculture is pursued in whole or in part by the aid of irrigation. The famous wine districts of France, Italy and Germany are located within, or are adjacent to, arid regions made fertile by a grand and extensive system of irrigation. The arid regions of Spain produce wines and raisins of world-wide fame; so also in Australia and in our own sister State of California, we find the most magnificent

grapes to be grown only in the more arid regions that are dependent entirely upon irrigation.

PRUNING.

WM. M. GUMM: On the subject of pruning, I would say that many of the amateur growers do not understand or do not avail themselves of the advantages to be gained by summer pruning. My theory is not to let too much wood grow, cutting away the lateral shoots and training to one, two, three or four branches which, by thus being given the full strength of the roots, will rapidly grow in strength and stockiness.

J. H. NEWCOMB: I think the trimming can be attended to if adopted early in the spring, when the leaves start, by pinching back with thumb and finger, and during the growing season not using the knife at all; where they are wanted for trellis or arbor, keeping to a single cane the first two years or more, then starting from the main cane to suit the party's taste.

V. DEVINNY: Grow but one cane the first season; late in the fall prune down to within six inches of the ground; next season allow two canes to grow, rubbing off all summer shoots that start, also those side shoots on the two canes for a distance of two feet at least upward, not only that they may ripen their wood but that they may become stronger. On strong vines one bunch of grapes may be allowed to grow the second year without injury to the vines. Prune the two canes at the end of the second summer down to two eyes each; from these four buds grow four shoots which should bear fruit if the vine is thrifty.

TRAINING.

Vines are allowed to run on the ground, in Colorado, and but little, if any, training is done. J. W. Cook, the veteran grape grower on Ralston Creek, says this is the natural and only way. It must be admitted that it is an

easy and cheap way—some might say a lazy man's way. Still, thus far it is the prevailing method, though here and there, both in Northern and in Southern Colorado, we have seen trellised vines bearing nobly.

MR. VALENTINE DEVINNY says: Neither rust, rot nor mildew result from untrained vines in this State, hence this expensive labor is avoided. There is also an apparent advantage in allowing grape vines to run upon the ground which is worthy of mention. As the fruit rests upon or hangs near the earth's surface, it gets all the benefits of the radiated heat during the cold nights that prevail in Colorado during the period of ripening. This is breathed upon and through the fruit, which hangs beneath a thick coat of leaves which confines it like a blanket. Thus is the fruit hastened in ripening by greater warmth during the cold nights.

WINTER PROTECTION.

V. Devinny in 1879 furnished to the columns of the *Colorado Farmer* several papers on the cultivation of the grape, in which he claimed the honor of having been the first to publish and suggest winter protection to the grape vine by covering with earth, thereby revolutionizing the old system of culture. By means of this new method he feels sure that Colorado will be made as famous for its grapes and wine as it is now for its gold and silver.

WM. M. GUMM: As far as my experience has taught me I think that the vines should be laid down early in the fall to secure a crop.

W. A. HELM: Vines must be buried, however, in winter. I stake them in the growing season, then lay them down and cover them with at least a foot of dirt, keeping them so until all danger of spring frosts is over.

HENRY McALLISTER, JR: In early winter I remove the vines from the trellises, prune back, but not closely, cover them with earth and cut back quite heroically in the spring when the covering is removed.

J. H. NEWCOMB: In the fall lay them down and cover with dirt. If not actually necessary they will richly repay the trouble for the first year or two in starting and growing more vigorously. When once established, they will nearly take care of themselves.

V. DEVINNY: We must protect our grape vines from the drying effects of the air, as well as from severe freezing. The object to be obtained, therefore, in protection is to keep the vines moist during their winter rest and protected from excessive frost and repeated thawing and freezing. Nothing is better as a protection than earth, either dry or moist, banked up high around the vines, to be left until early spring, when the earth should be carefully removed.

There is, however, at least one person in Southern Colorado who does not cover his vines in winter. It is Mr. Anson Rudd, of Canon City, who has quite a number of grape vines of long standing. These he grows upon trellises, and has never laid down and covered in winter. He has a grape arbor that reminded us of those familiar to and connected with our earlier life in New York State.

TESTED VARIETIES.

E. R. SIZER: This year (1881) my Concord grapes drove all other grapes from our market. While they lasted the people would have no others. They said my fruit was thinner skinned, sweeter and more tender than California or Kansas grapes. I sold grapes at the hotels at West Las Animas to pilgrims from Kansas City who said I must be mistaken, they were too good for the Concord grape.

W. A. HELM: Though the Concord and the Martha do well, the Salem is the finest grape that can be grown in Colorado. It is a late starter, but ripens as early as the Concord. It is a cherry colored grape and ought to be planted in every garden.

ANSON RUDD: The Concord, Isabella, Hartford Prolific

and Union Village are those I favor most, though my belief is strong that every variety known can be grown here.

HENRY McALLISTER, JR.: I have grown quite a crop of Concord grapes. I recommend the earliest ripening kind, such as Pocklington and Moore's Early, especially the latter. None that ripen later than the Concord should be grown.

E. R. SIZER: I have now in bearing 1,225 Concord vines and 100 Creveling. I have also planted 1,000 Martha and 1,000 Catawba.

J. H. NEWCOMB: Persons wanting varieties that ripen later than the Concord will fail with the crop.

J. WOLFF: Care should be taken in the selection of hardy varieties, such as the Concord, Hartford, Martha and Delaware.

O. O. KENT: No grape as late as the Concord will do well on the clay soils of Colorado. The Iona is a late grape and therefore undesirable. The best grapes for Colorado, in my opinion, are the Delaware and the Clinton.

COLORADO FARMER: J. H. Newcomb brought us in to-day—Sept. 1st.—some sample bunches of thoroughly ripe Delaware grapes. Also a new variety (foreign), the Early Madeline, which is a small black grape, but of delicious flavor, very compact on the bunch, and from its early ripening will, no doubt, prove a valuable grape for Colorado.

A. E. GIPSON: So far the Concord, Hartford, Delaware, Martha and Iona have done well with me.

J. H. NEWCOMB: The Crevelling is the best black grape for Colorado.

A. N. HOAG: I have fruited the Martha, which I think will in time supercede all others, it being very sweet and early. I put the Concord, Delaware, Clinton and Martha in the front rank out of nineteen varieties that I have in cultivation. I have about an acre of five year old vines.

W. A. HELM: I prefer the Salem for Southern Colorado. It is a strong growing vine, with a broad, clear leaf

and beautiful, abundant clusters of fruit, whose flavor can best be described as that of distilled rose water.

E. J. HUBBARD: I grow Concord, Talman, Hartford and Ives' Seedling. The Talman ripens August 17th with me and is in every respect perfect. I think, however, that the Concord is more particularly adapted to the soil and climate of Southern Colorado than any other variety.

PERRY WHITE: I have some five or six hundred vines, mostly Concord, some Delaware, and some Rogers No. 15. I consider the Concord the best grape as far as yield is concerned, the grapes being large and the clusters full. The Delaware, however, is the sweetest grape.

VALENTINE DEVINNY: I place the following in the order of their excellence with me: Chasselas, Delaware, Champion, Massasoit, Black Hamburg, Croton, Martha, Brighton. The Hartford Prolific, Crevelling and Ives do not do well with me on clay soil.

G. W. WEBSTER: The Concord grape proves by far the best for Colorado. It is the grape for the million. The Hartford Prolific is a standard. The Clinton for a sour grape is recommended.

FOREIGN VARIETIES.

V. Devinny claims that the foreign varieties, *Vitis Vinifera*, such as the Chasselas, Frontegnans, the Muscats, etc., etc. are to be the market grapes of Colorado. He says: "These noble sorts never mildew nor rot in the pure, healthful air of our climate, and as they are far superior in quality and flavor to any other, they are a great acquisition, and will, in the not distant future, be produced in vast abundance for home consumption and export."

W. A. Helm has over sixty bearing vines. In addition to the Concord and other Eastern grapes, he has grown for several years four California varieties, the Muscatel, Rose of Peru, Sweet Water and White Chasselas, all white except the Rose of Peru. These have been in bearing for the last

four years and he says they will undoubtedly do well in Colorado.

At Fountain City, twelve miles south of Colorado Springs, much attention is being given to fruit culture, and much fruit is being raised there. Mr. O. S. Loomis, has been quite successful in growing grapes. He thinks Southern Colorado will become a great grape country. He not only grows the hardy grapes of the *labrusca* varieties, but has succeeded well with some of the *vinifera*. Last season he had quite a quantity of Muscat grapes. He always buries his vines carefully in winter.

Mr. J. H. Newcomb, in an address before the El Paso County Horticultural Society, in October, 1881, gave it as his firm belief that the best of the foreign varieties that could be grown in Colorado is the Chasselas de Fontainbleu.

Mr. V. Devinny is a firm believer in the ultimate successful culture of the foreign varieties in this State. He gives the following list of those that promise well in his vineyard: Sweet Water, Chasselas Fontainbleu, Chasselas Musque, Black Hamburg, Black Madeline. These are all early varieties—earlier than Concord—ripening fruit as early as the Delaware.

SUGGESTED NEW GRAPES.

Among the new varieties of great merit, Mr. E. R. Cosson recommends the following:

Duchess—One of the most promising and rich flavored of the new white grapes. Ripens between Delaware and Concord; foliage healthy; vine very productive and perfectly hardy. Has stood *unprotected*, with mercury $24\frac{1}{2}$ degrees below zero, without injury.

Early Victor—This variety is one of the hardiest of the *Labrusca* type, vigorous in growth and very productive. One week earlier than Moore's Early, and greatly superior to it in flavor and quality. Reliable and certain in fruiting.

I firmly believe that this will prove to be the best black grape yet introduced into Colorado.

Pocklington (see plate).—Will succeed where the Concord does. It is the most popular of all the new varieties of hardy grapes. It is claimed that it has never been injured by cold, although it has stood a temperature of 34 degrees below zero.

Prentiss—A splendid white grape. Vine a good grower, very productive, hardy, buds having stood uninjured with thermometer fifteen to twenty degrees below zero. An excellent keeper. Ripens with the Concord. Is well worthy to be classed among the best.

Vergennes—An amber-colored grape; clusters large, flavor rich and delicious; ripens with Hartford Prolific; excellent keeping qualities. Vine hardy, a strong, rapid grower; has been known to make fifteen feet of wood in a season. This grape possesses many good traits and is worthy of an extended trial in Colorado. It is claimed that two-year vines generally fruit the next season after transplanting, which is worthy of great consideration, if true.

Worden—Fast growing into favor in Colorado. One of the best new grapes of the Concord variety. Large in bunch and berry; very handsome; in every way superior to the Concord; earlier and more hardy and vigorous. Ripens with the Hartford. I heartily recommend it for Colorado.

FRUIT LANDS.

IN THE GRAND RIVER COUNTRY.

FRUIT growing, it is thought, will be a prominent industry in Grand River Valley, as it lies in the same belt with the best California and Utah fruit-growing sections. The altitude is 4,500 feet, and the climate is one of the best. But twice did snow fall at Grand Junction during the winter of 1881-82. Water is found at a depth of 30 to 40 feet, coal adjoins the town site, lime and sand rock are abundant, and it would seem as if this fair town had a bright future before it as the center of a fruit and grain growing country. When we look at Greeley, Fort Collins, Longmont, and remember what they were ten years ago, we can well imagine that towns as fair and prosperous and communities as thriving and as happy will be found in the next decade in this valley where of late only the dusky Indian's feet were treading, and his guttural voice was heard, making discordant echoes in the wilderness. Now the early morning light of pioneerism is breaking over the valley, to be followed shortly by the bright beams of the rising sun of civilization.

In an article on the Fruit Lands of the Future, written by D. S. Grimes, and published in the *Colorado Farmer*, September 21st, 1882, he says: "The new Colorado, of which the fertile valleys of the Uncompahgre, Gunnison and Grand rivers form a part, offer to the fruit grower advantages in markets, soil, climate and water found nowhere else in the State. In the Grand River Valley especially, peaches, quinces and apricots can be grown, as well as apples, pears, plums, cherries and small fruits. In the cul-

tivation of the grape we find here in soil and climate, conditions highly favorable to the growing and ripening this delicious fruit. The supply of water for irrigation, which is already causing serious apprehension in the minds of farmers living along the streams that flow east from the mountains, is in those western rivers inexhaustible. Here we have more rain fall in summer, and more snow fall in the mountains in winter. Thriving springs of pure water abound everywhere in the mountains. The rivers are deep, rapid running streams, carrying a large volume of water through the whole season, affording without stint all the water needed for irrigation—a valuable consideration to the Colorado farmer and fruit grower.

“The soil is rich in all the elements of vegetable production, and being of a light, ashy color, the heat of summer has not the scorching power as upon dark-colored soils. The degree of cold seldom falling below zero in winter, with an altitude of 4,500 feet, is sufficient evidence of a highly-favorable locality for fruit growing. In considering the profits likely to be gained by fruit culture on this reservation, a glance at the map will show that we are in easy access of Ouray, Lake City, Gunnison, Pitkin, Aspen, Leadville, and all the rich mining camps around these thriving towns and cities.

“The South Park, Eagle River, and Denver and California roads will all pass through this region of country, thus opening up a fruit market in every important mining district in the State.

“With soil, climate, water and cheap lands at the very door of the best fruit markets in the world, we will now consider the cost and profit of fruit culture under experienced management, giving the wholesale quotations of fruit in Denver as the ruling prices, and see what a little money, backed by honest industry, will do in fruit growing in this new Colorado. In an enterprise of this kind much depends upon a correct knowledge of the demands of the markets

to be supplied, as well as the manner of planting and cultivation. Taking it for granted that after buying and improving ten or twenty acres we have in cash \$500 or \$1,000 to invest in fruit trees and small fruits, we will see what a growing valuation will lead to in ten years. As a guide to our estimates of cost and profits we will take ten acres of small fruit and ten acres of standard fruit, leaving the prospective planter to combine or divide the quantities as will best suit the area of land to be planted. Beginning with ten acres of small fruit our account the first year will stand thus:

NO. OF ACRES.	VARIETIES OF FRUIT.	DISTANCE OF PLANTING.	NO. PER ACRE.	TOTAL NO.	COST.
2	Strawberries.....	3½ feet, 1½ feet in row	12,445	24,890	\$100
1½	Currants.....	4 feet apart each way	2,722	4,083	150
1½	Raspberries.....	7 feet, 4 feet in row	1,550	2,325	50
3	Blackberries.....	7 feet, 4 feet in row	1,550	3,100	50
	Grapes.....	6 feet, 8 feet in row	900	2,790	150
10					\$500

SECOND YEAR.

2 acres strawberries, half crop, 2,500 quarts, 20 cents..... \$ 500

THIRD YEAR.

2 acres strawberries full crop, 5,000 quarts, at 20 cents 1000
 1½ acres currants, 1,350 quarts at 20 cents 270
 1½ acres raspberries, 1,500 quarts at 25 cents 375
 2 acres blackberries, 2,000 quarts at 20 cents 400
 3 acres grapes, 10,000 pounds at 4 cents 400

FOURTH YEAR.

2 acres strawberries, 5,000 quarts at 20 cents 1000
 1½ acres currants, 4,000 quarts at 20 cents 800
 1½ acres raspberries, 3,000 quarts at 25 cents 750
 2 acres blackberries, 4,000 quarts at 20 cents 800
 3 acres grapes, 25,000 pounds at 4 cents 1000

FIFTH YEAR.

2 acres strawberries, 5,000 quarts at 20 cents \$1000
 1½ acres currants, 5,000 quarts at 20 cents 1000
 1½ acres raspberries, 3,000 quarts at 25 cents 750
 2 acres blackberries, 4,500 quarts at 20 cents 900
 3 acres grapes, 30,000 pounds 4 cents 1200

\$4850

In an orchard of ten acres of standard fruit we can also plant between the rows strawberries, currants, gooseberries and grapes without injury to the trees; or cultivate vegeta-

bles the first six years and then seed down to clover, which will pay all expense in cultivation.

"With ten acres of standard fruit our account of cost and profit will stand thus:

NO. OF ACRES.	VARIETIES OF FRUIT.	FIRST YEAR.	NO. PER ACRE.	TOTAL NO.	COST.
		DISTANCE OF PLANTING.			
5	Apples	25 feet apart each way	69	345	\$100
2	Peaches	15 feet apart each way	193	386	100
1	Pears	15 feet apart each way	193	193	100
1	Cherries	15 feet apart each way	193	193	100
1	Plums	15 feet apart each way	193	193	100
10					\$500

No income from fruit until third year.

THIRD YEAR.

2 acres peaches, 100 bushels \$200

FOURTH YEAR.

5 acres apples, 75 bushels \$112
 2 acres peaches, 410 bushels 820
 1 acre cherries, 25 bushels 75
 1 acre plums, 25 bushels 75

SIXTH YEAR.

5 acres apples, 400 bushels \$1082
 2 acres peaches, 800 bushels 800
 1 acre pears, 200 bushels 600
 1 acre cherries, 200 bushels 600
 1 acre plums, 200 bushels 600

EIGHTH YEAR.

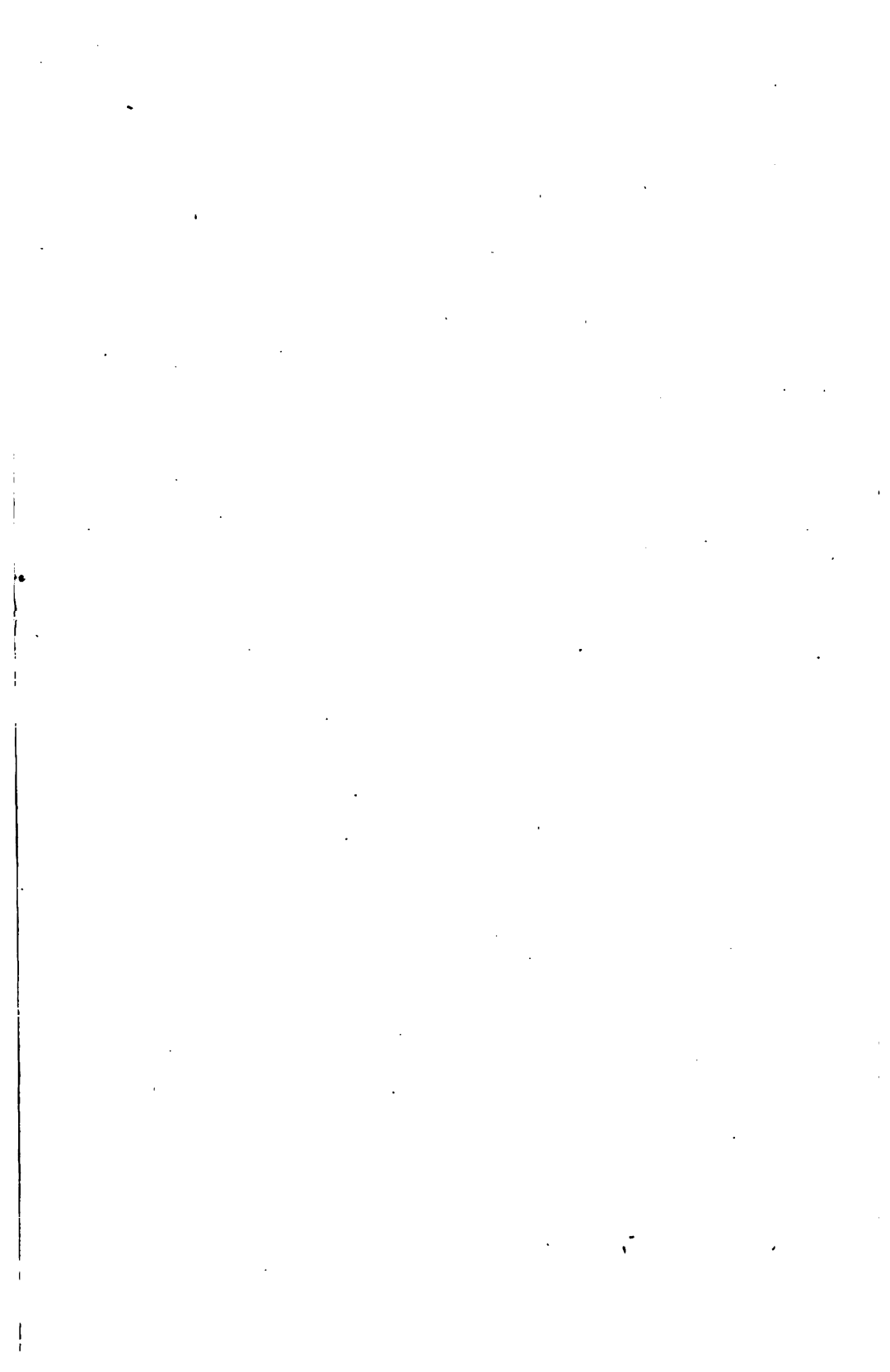
5 acres apples, 1,200 bushels \$1800
 2 acres peaches, 1,000 bushels 2000
 1 acre pears, 300 bushels 900
 1 acre cherries, 300 bushels 900
 1 acre plums, 300 bushels 900

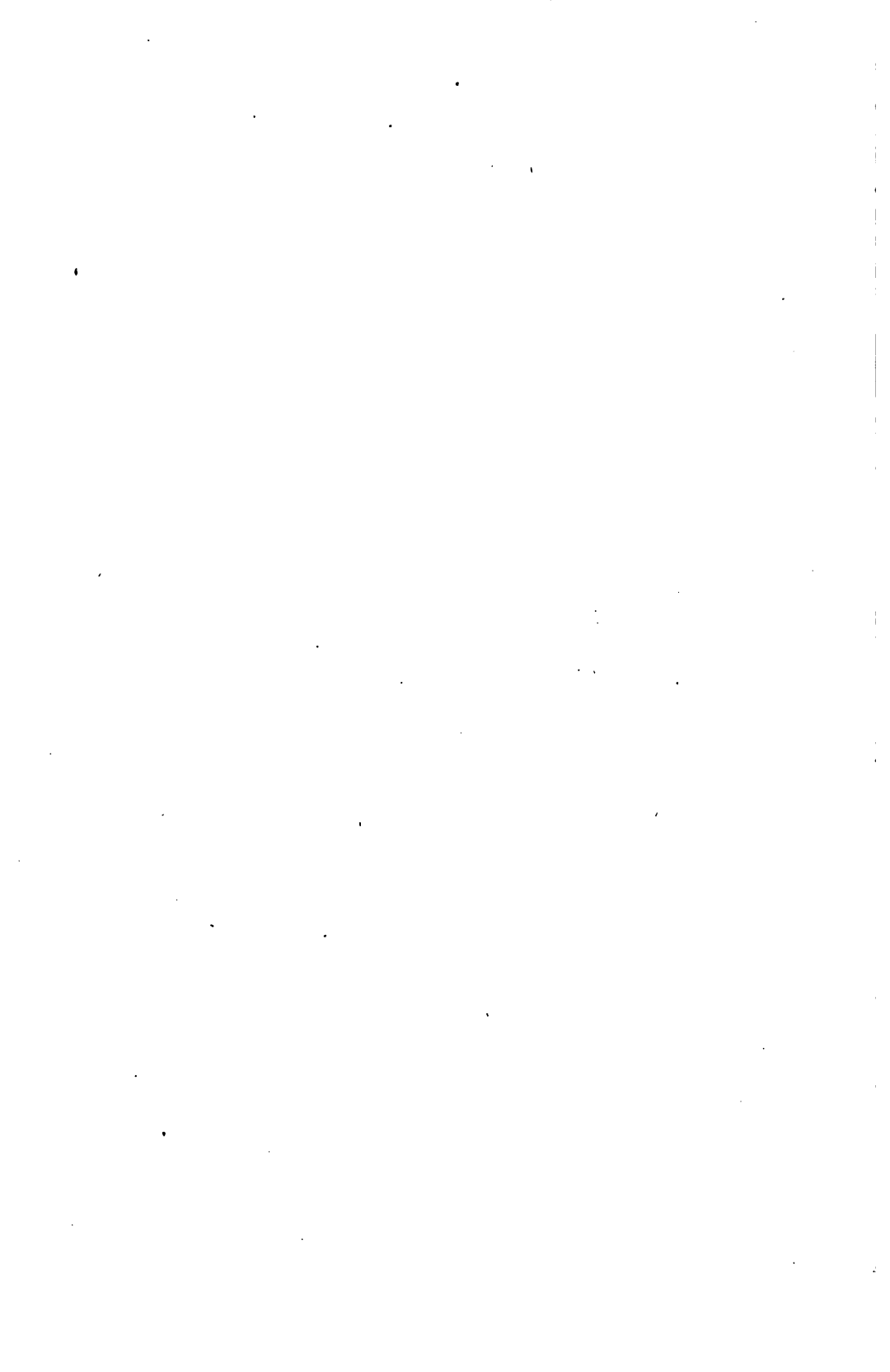
TENTH YEAR.

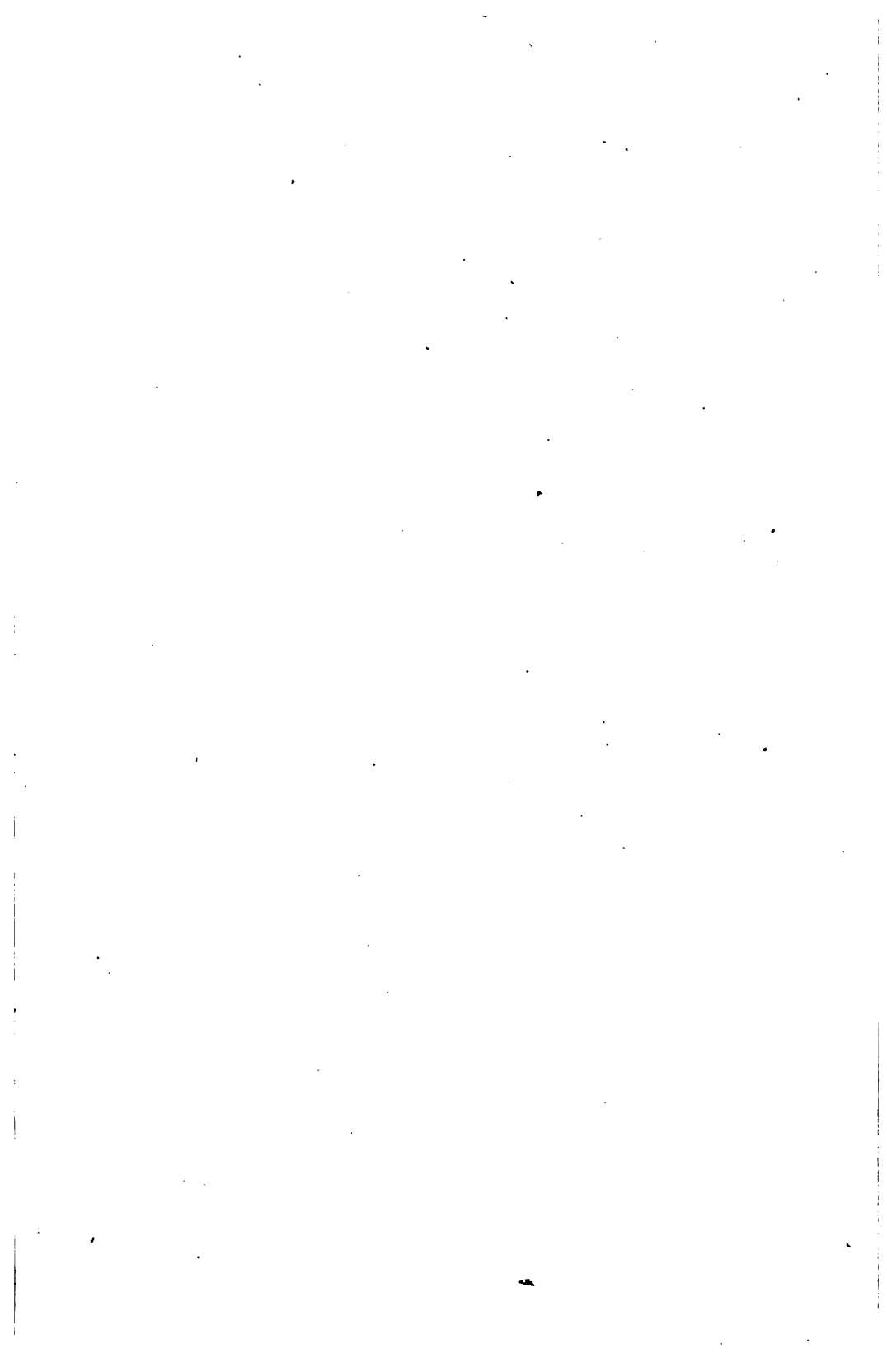
5 acres apples, 1,800 bushels \$6500
 2 acres peaches, 900 bushels 1350
 1 acre pears, 400 bushels 1200
 1 acre cherries, 400 bushels 1200
 1 acre plums, 400 bushels 1200

Total receipts for five crops of fruit in ten years \$7650
 \$19432

"Deducting twenty per cent. of the gross receipts for expense in gathering and marketing the fruit crops we have remaining to the credit of the orchard \$15,546."







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